30 1927 TECHNICAL DEPT.

AVIATION

The Oldest American Aeronautical Magazine

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Action photo of a Boeing mail plane (Wasp) on the Chicago-San Francisco route

VOLUME XXIII NUMBER 22

Special Features

The Ireland Amphibian
Radio and Air Commerce
The Bendix Wheel and Brake

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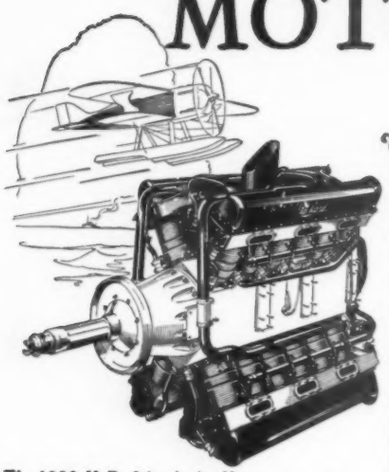

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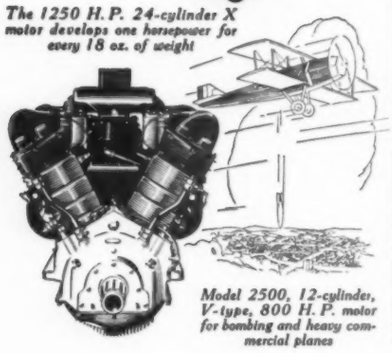

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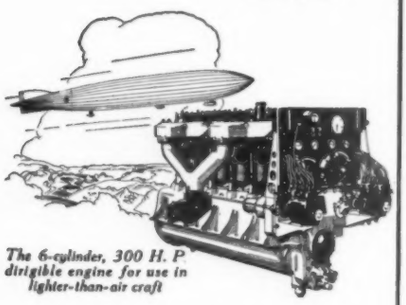

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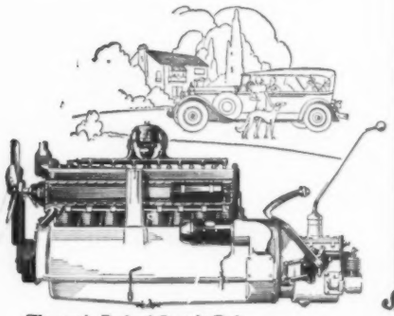

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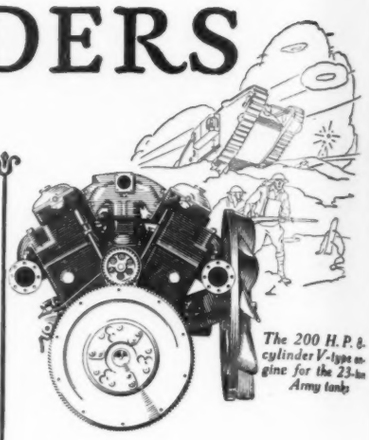

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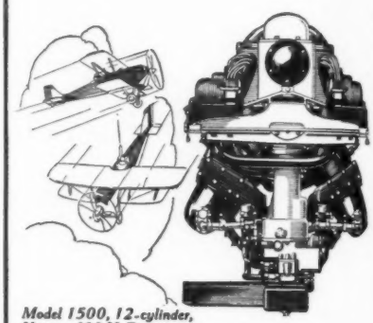

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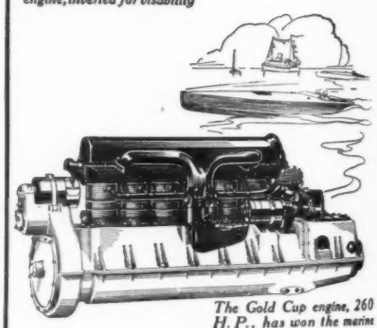

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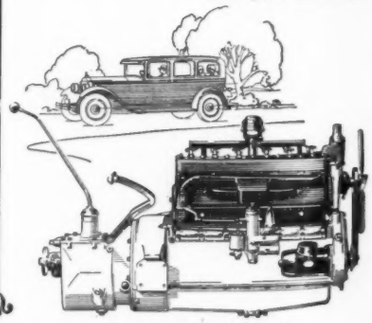

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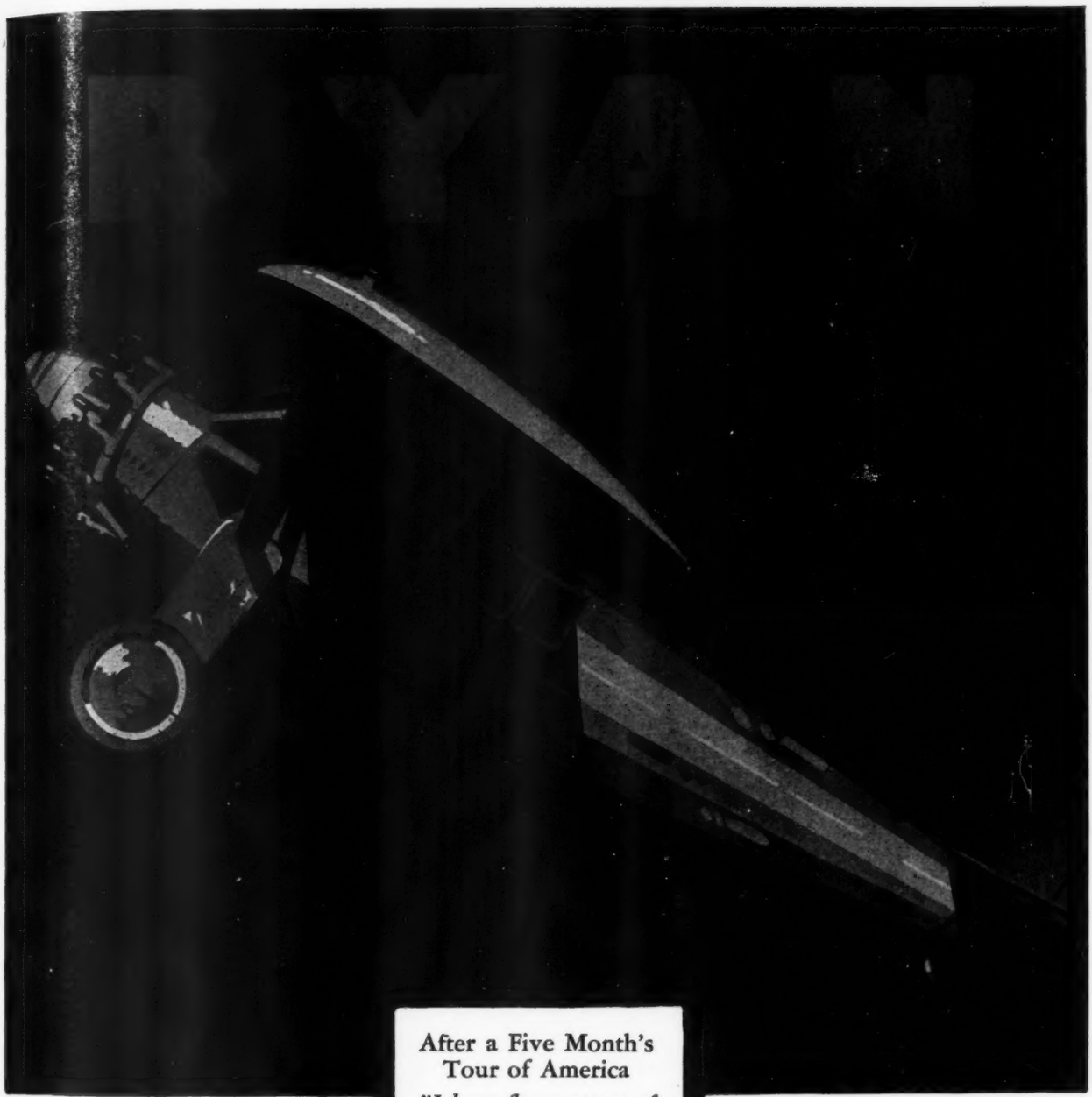

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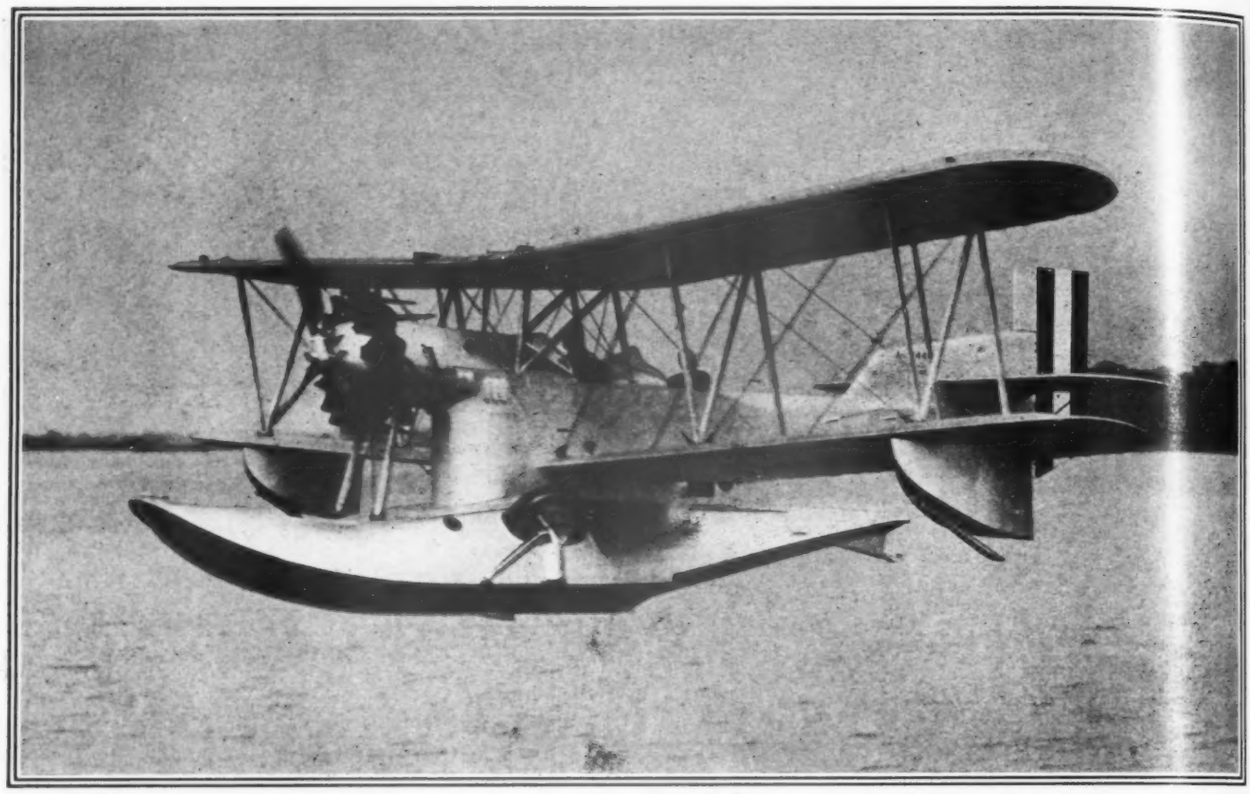
The B. F. MAHONEY AIRCRAFT CORPORATION, *San Diego*



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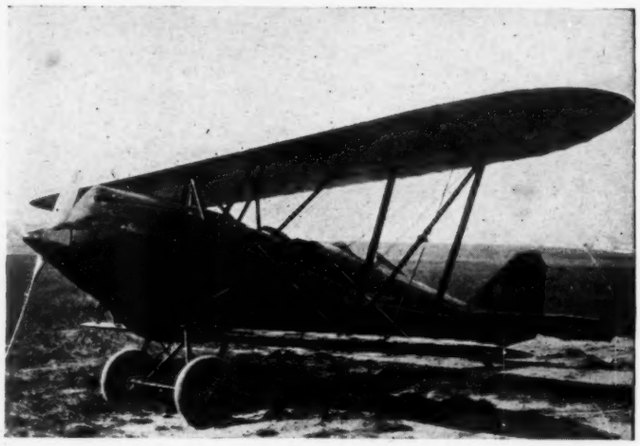

The Pitcairn Sesquiwing, which James Ray piloted to first place in the two fastest civilian races at the Spokane National Air Races.

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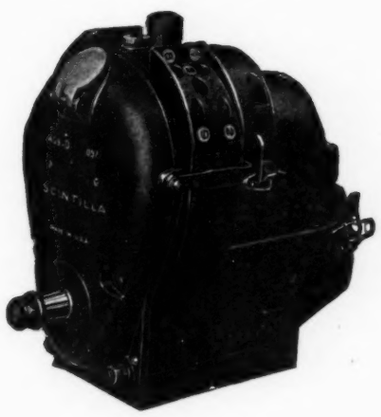

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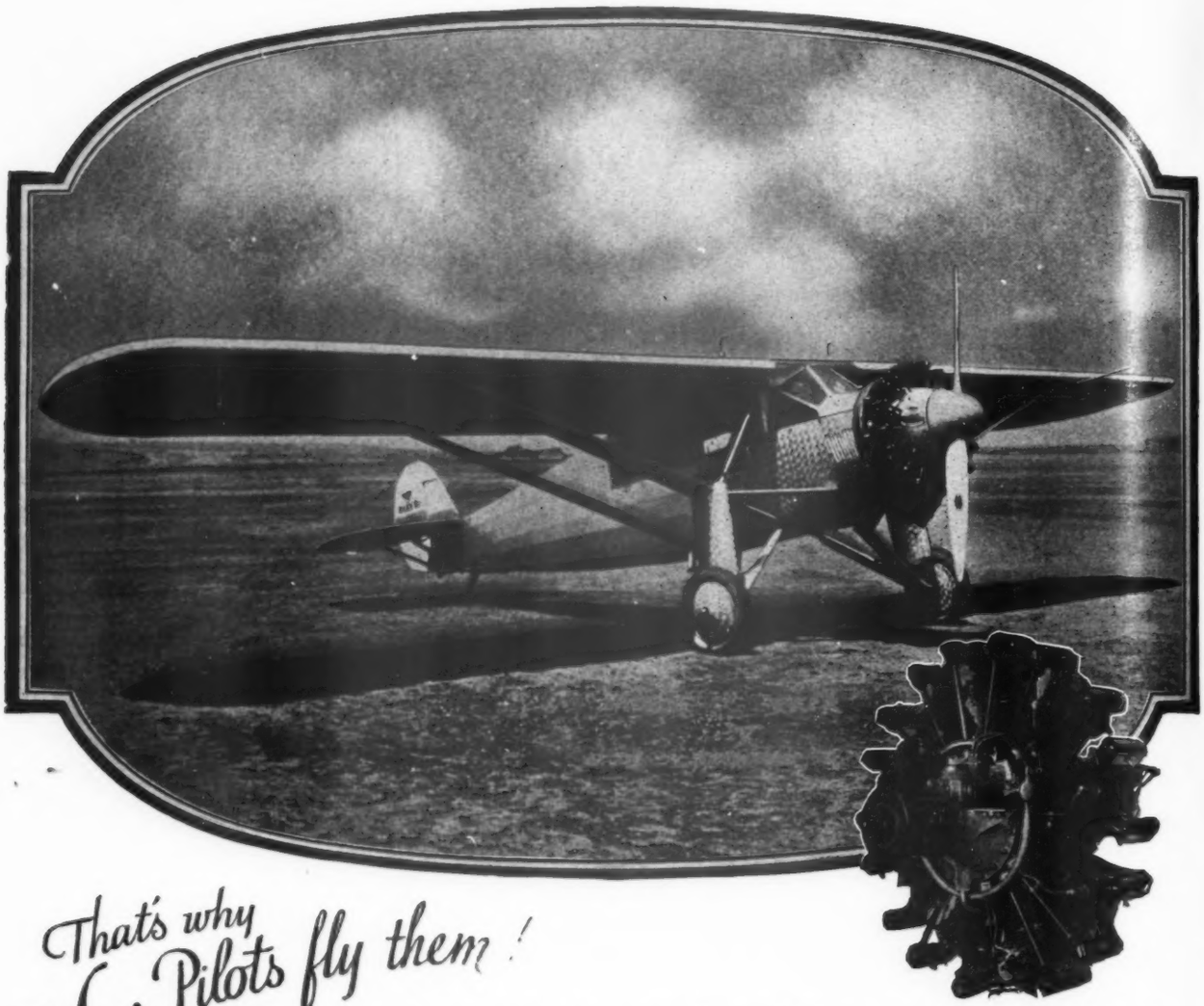

That's why More Pilots fly them!

THE extensive use of the Ryan Brougham on mail routes on the Pacific Coast has demonstrated it to be a worthy companion of its sister ship "The Spirit of St. Louis".

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A SUPERLATIVE AERONAUTICAL
engine

AVIATION

The Oldest American Aeronautical Magazine

Vol. XXIII *NOVEMBER* 28, 1927 No. 22

Opening of Congress Nears

CONGRESS WILL convene on Dec. 1, and from then until spring there will come from Washington aeronautical news of the greatest importance.

The President's Message is always an index which points to the probable extent of the advance of government aviation for the next fiscal year. This year it is certain to contain much of importance owing to the great personal interest President Coolidge has taken in aeronautical events. Then the Budget submitted by the President to Congress ought to reflect popular enthusiasm by increased allowances for the aeronautical activities of the Government. The acute mind of Brig. Gen. Lord, director of the Budget, has absorbed much of the aeronautical enthusiasm that has been in evidence in Washington, and his budget allotment for the various departments, with the sanction of the President, will again, it is believed, give added encouragement to all airmen.

The Committees of Congress will have their hearings from which will come the mass of information that always is so enlightening. The debates on the floor of both Houses reflect the sentiment in various parts of the country. Possibly an investigation or two will be started—at least it will be remarkable if they are not. The heads of Departments and Bureaus will make reports giving the record of their work for the year in aeronautics.

Our readers may expect for a few issues to find a great amount of such news in AVIATION, but when Congress settles down to its routine procedure, everyone, including editors, will get back to normal.

More Honors

NOW THAT the open season for trans-Atlantic flying is over, there has been a natural desire to secure from the experiences of the fliers as much information as possible. The first general meeting was held in Washington at the time of the presentation of the Hubbard Medal of the National Geographic Society to Col. Charles Lindbergh by President Coolidge. Asst. Secy. MacCracken held a meeting at which practically every oversea flight was described by one of the participants with special reference to weather conditions. Out of this conference has come several very definite recommendations that will not only affect oversea weather forecasts but all weather predictions for airmen.

One point was very clear. The weather men and the pilots do not speak nor understand the same language. As a consequence there have been misunderstandings that it is believed may be avoided in the future. Skippers of vessels have used the weather reports so long that they have developed a terminology which is clear to all. It has been found that this is not the case with fliers. The importance of a clearer understanding of terms was one of the important results of the conference.

Another suggestion was made concerning the necessity of receiving reports of wind velocity and direction from different altitudes. Hitherto, all reports have been concerned with surface conditions. This had not proved satisfactory and the service will have to be augmented to include altitude observations if the weather reports are to be of the greatest value. Other similar conferences will be held and many constructive suggestions made as to the improvement of conditions surrounding experimental flights of the future.

Make Profits

EVEN FROM the earliest days of aeronautics many men have been making a living and even making money out of flying but there have been an even larger number who have stayed in the game because they were passionately fond of it. There have been some men who have made money out of investing in aeronautical ventures but the majority of those who have put up money have done so for the sake of the adventure and interest. The interest and money of these men have done much to stimulate commercial aviation and to keep the game alive but it must also be admitted that they have done much harm for their competition has been unfair to those who were trying to make a decent profit.

Too much emphasis can not be laid on the fact that if aviation is to grow it must be made to make money. Any enterprise which undertakes to sell either goods or service below cost is not only sowing the seeds of its own ruin but is working a permanent injury on the whole aeronautic industry. Fortunately American aviation is not based on governmental subsidy but in many cases aeronautical enterprises have been based on what might be termed private subsidy. In the initial stages this was perhaps right but it is not altogether fortunate that there has been sufficient wealth in the country to be willing to back ventures which were almost certainly doomed to failure.

It has been proved that both the operation and the manufacture of planes can be done profitably but these profits are being menaced by groups here and there who through the expenditure of capital are operating or manufacturing below actual cost. These groups expect to be able to produce at a lesser cost than their experienced competitors and are perfectly sincere in feeling that their ability and facilities justify their price cutting but in the long run they almost inevitably find that they are wrong. No industry is permanently helped by trying to produce goods or service below cost. A decent profit is one of the essentials in the growth of an industry.

A model radio beacon of the type likely to be installed on American Airways

Radio *and* Air Commerce

A Review of its Values to the Pilot Aloft Which Justify Continued Adoption

By LAWRENCE A. HYLAND
Radio Engineer.

Article One

THE AVIATION industry of this country has been given tremendous impetus by reason of the recent spectacular long distance flights. Public attention has been focused on airplanes and engines, pilots and navigators, and on rubber rafts and radio.

Those of us who are immediately concerned with the future of aerial navigation have not looked upon these flights as stunts, but have regarded them as difficult trials in which everyday problems raised to the "nth" power were solved or pointed out for the benefit of the entire country.

The outstanding feature of the transoceanic flights and of the annual Ford Reliability Tour has been that American aerodynamic and engine design appears to have progressed further than has aerial navigation and communication. Actually, such is not the case. Navigational aids of great reliability, simplicity and precision have been developed, excellent radio communication equipment has been designed, but there is no demand for either as yet.

In Europe, on the other hand, the development and use of radio for aircraft communication and navigational purposes has kept pace with the advances made in airplane and engine performance. This is one of the results of the vastly different conditions under which the Air Commerce of the two continents has been conducted.

It is necessary to consider the reasons for the divergence in the American and European aviation radio policy in order that the future place of radio in the air commerce of the United States may be determined.

Government airline subsidy is the primary reason for the use of radio on European commercial aircraft during the last few years. This subsidy worked two ways. It gave the governments the right to specify what type of aircraft should be used and what accessory equipment should be carried. Also operators were protected from loss due to high costs and running expenses. Hence the aircraft and engines have been of advanced design, capable of carrying fairly large loads. Moreover nearly all European governments have, by regulation, made the use of radio compulsory on all public air transports. The operating companies suspecting the advantages of radio communication and direction finding, yet unworried by costs or reasonable weights, were quick to comply with the government regulations by installing complete radio outfits.

Airline Operators Must Pay Own Way

American airline operators have always been under the necessity of paying their own way. Until recently, surplus warcraft were the standby of the commercial airmen. Every pound of extra equipment carried cut in heavily on the pay load of these underpowered machines. Every dollar spent for radio would have been an added dollar on the red side of the ledger. The U. S. Air Mail was not entirely free from this phase of the situation. Rebuilt de Havillands are not notorious for their load capacity. Furthermore the experimental radio equipment of the government air mail service was built along military lines, unsuitable for commercial craft

by reason of special features which add much to the weight and size.

Until this summer, European conditions demanded radio installations to a far greater extent than did the American situation. The bulk of air traffic on the continent has been passenger transportation. Then, too, the cross channel route has involved the carrying of passengers over a bad area of water for a distance of around twenty miles. Obviously every effort had to be made to guard the lives and comfort of the passengers else there would have been no commercial air lines.

In this country there has been no extensive passenger traffic. The comparative few that have flown made use of air transport more as a sporting proposition than as a speedy carrier. A few freight routes were in operation mostly as feeders to government lines. Only in the Air Mail were operations conducted on a scale which would have warranted the use of radio equipment. However, the character of the service, the results without radio and the state of the radio art itself all contributed to the non use of wireless equipment on any but experimental flights.

The year 1927 has seen far reaching changes in American aviation. The public has become aware that aircraft are good for something more vital to the common weal than aerobatics and barnstorming. The carrying of mails by air has been turned over to private contractors. Congress has finally taken heed of the newest of common carriers and has authorized and partly provided for a system of airways throughout the country. A great express company has entered the field. Henceforth the air commerce of this nation will expand rapidly and in a few years the basic operating principles will differ little from those which have been found essential in European airways.

European air transport operations have shown that the installation of suitable radio equipment aboard the aircraft in combination with an adequate ground system provides an efficient means for controlling air traffic. In particular radio permits the pilots to receive meteorological information for any point en route, to broadcast warnings of distress and thereby obtain speedy relief, and to secure navigational aid when flying through fog or other inclement weather. That these are not theoretical considerations is evidenced by the fact that European governments after years of trial are making wide extensions to the existing radio facilities to the end that a complete ground radio organization may be available to aircraft. In Fig. 1 is shown a sketch of the French air radio system now in operation or in the progress of installation. The 82 stations are made up of eight with a range of 500 mi., 31 with a range of 200 mi., 26 with 100 mi. range, and 17 direction finder stations. It should be remembered that this ground organization has been built up around daytime flying for as yet the French have confined their night flying to experimental work. Needless to say the full utility of such a comprehensive radio system will be realized at night. Another novel point is that the number of radio stations listed totals up greater than the number of landing fields, due to the location of several types of radio stations at the more important fields.

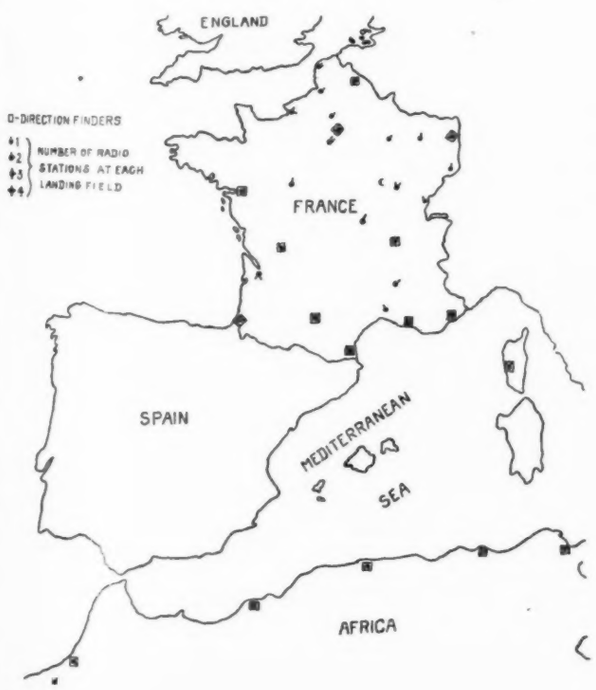


Fig. 1. Sketch of the present and projected French air net.

Installations Required by European Governments

For the airplane, equipment and operating regulations are becoming more strict each year. In accordance with international agreement the principal European governments require, by statute or regulation, the following installations on public air transports:

1. For the larger aircraft (ten passengers or more) equipment capable of sending and receiving either interrupted or continuous waves on four wavelengths.

2. For the smaller craft (less than ten persons) equipment for sending and receiving interrupted waves on two wavelengths.

Furthermore the governments have nearly all indicated that in the near future a licensed operator devoting his entire time to radio will be required for the larger planes, while on the smaller a licensed operator will be required but may be the pilot. As a matter of fact the larger air lines have found radio to be of such value that a separate operator is already provided on the larger craft.

In the United States the need for adequate radio equipment on air transports and at landing fields will be greater than that which has been found to exist in Europe. The distances flown between landing places of American Airways are far in excess of those on the European routes. Weather conditions are subject to similar normal variations and occasional more violent disturbances. Fog is hardly less of a problem than on the French coast. Increased traffic will bring the same problem of despatching or reporting that the multiple plane routes of English, French and German companies now have. The rugged terrain of the eastern, western and southern mountain chains on the American continent, and the scarcity of landing places throughout these areas make navigation and emergency provisions of prime importance.

The ground aviation radio organization in the United States is, at present, a government function. As with marine radio the government will probably set up and operate stations as a matter of public policy during the pioneering period. Whether these aircraft ground stations will be ultimately turned over to private enterprise is a matter for the future to determine.

Three bureaus of the Department of Commerce are now concerned with the radio equipment of the landing fields and intermediate stations of American air routes. In general the duties of each are as follows: Bureau of standards: Development and technical problems. Bureau of Lighthouses: Installation and upkeep. Bureau of Aeronautics: Coordination.

In addition to recognizing the importance of the commer-

cial aviation industry by the creation of a Bureau of Aeronautics within the Department of Commerce, Congress also made an appropriation for the establishment of permanent airways. It is with a part of this fund that the three Bureaus are proceeding with the development and installation of proper radio equipment on air routes.

The Bureau of Standards has contributed some excellent work especially that in connection with the radio beacon. A comprehensive research policy has been inaugurated.

The Bureau of Lighthouses on whom devolves the actual construction and operation of the stations along the airways is proceeding as fast as funds will permit. The greatest effort of this year is to install lighting systems on airways. That radio devices are being developed and made available at all shows commendable foresight on the part of the officials of the Department of Commerce, for it must be admitted that there is now an extremely limited demand for such service.

An Operator's Expense

Radio equipment on the aircraft itself is not and probably never will be a government function, except in a regulatory way. It is the operator who must provide and pay for the equipment, who must train his pilots or hire radio operators. There is little likelihood that radio equipment will be required by law on even passenger aircraft for some years. In the meantime it will be wholly within the operators' province to decide whether he will or will not have radio on his craft. Which reduces itself to the problem—Does the dollars and cents value of radio on an aircraft promise a fair return on the investment in material costs and personnel salaries?

For navigation purposes alone radio will prove invaluable to the air transport operator. Any one of several direction finding methods make possible the flying of a predetermined course when no landmarks or lights are visible. Not a few of the accidents which have occurred to air mail planes have been directly caused by fog or stormy weather which compelled the pilots to fly low in order that they might follow their courses by occasional glimpses of landmarks. It has not been unusual for the planes to stray many miles off the usual route in such cases. Crashes have occurred, especially in mountainous regions where low flying in the effort to secure visibility is an invitation to disaster. Had radio direction finders been available the pilots could have flown at any desirable height up to the ceiling of the airplane with perfect assurance that they were on course and that no unexpected mountain would loom up out of the obscured atmosphere.

Pilot Can Keep Course

While storms and fog are not infrequently met with it is only on very rare occasions that a pilot may not find some altitude within his attainment which will offer him good flying conditions. Heretofore it has not been practicable to utilize these altitudes above the clouds for the reason that an unknown wind would cause a drift that might place the unfortunate craft miles away from the destination with depleted gas supply and no available landing field. Informed by radio of proper weather conditions at his destination the pilot provided with direction finding service may steer serenely above the clouds or through them at ample altitude sure that he is proceeding straight on his course, and concerned only with the keeping of his plane in level flight.

Modern aircraft direction finding equipment has a reliable range far in excess of that required for any commercial flight. The equipment is very simple, easy to operate and is rugged.

Meteorological service is another vital help to an air transport pilot. Notification of unexpected fog, squalls or violent storms can be received on the airplane and the pilot can shape his course or his landings to avoid such conditions. Weather disturbances which affect airplane operations are serious for a limited time only. In the worst case the airplane may land at any emergency field until the disturbance has passed. The short delay is not comparable to the chance of a wrecked airplane with possible loss of life. Commercial operators cannot afford a series of crashes such as occurred at or near Chicago last spring when mail planes arrived to find the ground hidden by dense fog. For hours these planes circled the city until the gas supply had been exhausted. Then the pilots took to parachutes, and the planes were left to crash to earth. Not the most economical procedure. Nor the safest. Especially when the same radio equipment which is suitable for direction finding can be made use of for the reception of weather information. More training in its operation is needed, possibly, though even the slight amount of skill necessary for code work is not required when the ground station uses a radio telephone.

The value of emergency communication from aircraft in distress is also of importance. Provided with the proper apparatus a pilot can almost invariably send out some sort of warning before a forced landing. Location and need are thus broadcast by the distress message, two facts that frequently take hours and days to establish by present methods. Even the movie lion might have had breakfast as usual had the conveying airplane contained the most rudimentary of emergency radio gear. The centres of operation can, with receipt of notification of distress, proceed at once with aid. After landing it is possible for the crippled craft to send amplified details of the trouble if too serious injury has not incapacitated the personnel. For emergency communication some additional equipment is required above that necessary for weather reports and direction finding. By the nature of the service to be performed this material must be simple and rugged. Modern design offers such devices at reasonable cost.

The pioneer pilots of the American Air Mail have demonstrated unexcelled courage and resourcefulness in completing their trips on schedule. The inevitable crashes have shown the severity of the weather conditions that have been en-

Guess Who?

Some seventeen years ago a photographer snapped this picture of a 20 year old youth named Anthony Fokker, as he was seated in the first airplane that he ever built. Which, by the way, was constructed at Amsterdam, Holland.

countered in establishing a reliable transcontinental service.

The development of improved radio sets for aircraft makes it unnecessary and uneconomical for airline operators to call upon their pilots for daredevil performance in the face of unfavorable weather. Modern commercial aircraft radio equipment is neither heavy, nor bulky, nor complicated, nor expensive. Only normal common sense is required for its operation.

In the light of the above facts it would seem desirable for American air transport operators to investigate the merits of a radio installation, to examine the excellent ground communication and direction finding systems being established by the government, and to consider that the cost of one wrecked airplane will buy radio sets for a whole squadron.

Article Two by Mr. Hyland will appear in an early issue of AVIATION.

Paint and Varnish Firm Buys an Air-King to Advertise Products

THE MORGAN Company, Peoria, Ill., claims the distinction of being one of the first American paint and varnish manufacturers to recognize the airplane as an asset to its business and to purchase and operate a plane for the advertising of its products. A short time ago, a standard model Air-King plane was delivered at Varney Field, Peoria, by the National Airways System, Lomax, Ill. A crew of painters was put to work with spray equipment and in less than two days the plane was completely finished in the

The "Ace of Shades" in flight.

Morgan Company's standard yellow and blue colors and lettered with its advertising. The company's name appears in large letters on the bottom side of the lower wing and its trade-mark and slogan on either side of the fuselage. On the rudder appears an enormous playing card, in the center of which is a reproduction of a labeled paint can. Above the can is the very appropriate name of the plane, "The Ace of Shades".

The Ace of Shades was purchased by The Morgan Company as an advertising agent and since its purchase it has visited more than twenty cities, in which the company has branches or distributors. Advance display advertising tells the local public of the plane's impending visit and states that miniature paper replicas of The Ace of Shades, each bearing a number, will be dropped from the air. It is stated that certain of these numbers will entitle the finders to $2.50 each in gold and that the lucky numbers will be posted in the store window following the flight. Thus is the public interest secured in advance and a tie-up between The Morgan Company's products and its distributors secured.

In addition to the flying for advertising purposes, The Ace of Shades is also used by the company executives for trips where time is a factor. Piloting the plane is Lieut. O. W. Young, U.S.R.C., who was, during the World War, an instructor in advanced stunt flying and, who has the additional advantage of being an experienced paint and varnish salesman.

A daily log is kept by the pilot, which shows the cities visited with distance between, number of hours flown, gas

Rear quarter view of the Morgan Company's Air-King plane.

and oil consumption, location and condition of landing fields and a general summary of operations. To handle the operation of the plane outside its own business, a separate company, known as The Morgan Aircraft Corporation, was formed with Elisha Morgan, president; C. H. Reid, vice-president; E. L. Fritz, secretary; R. N. Brons, treasurer; and H. B. Sappington, Jr., general manager. The Morgan Company states that the publicity it has received to date is worth far over and above the amount of its investment and operating cost.

City Flying Laws Passed

THE CITY commission of San Antonio, Tex., recently passed an ordinance requiring registration and licensing of all aircraft carrying passengers above the city. According to Acting Mayor "Phil" Wright the ordinance has been approved by P. D. Cramer of the Aeronautics Branch of the Department of Commerce.

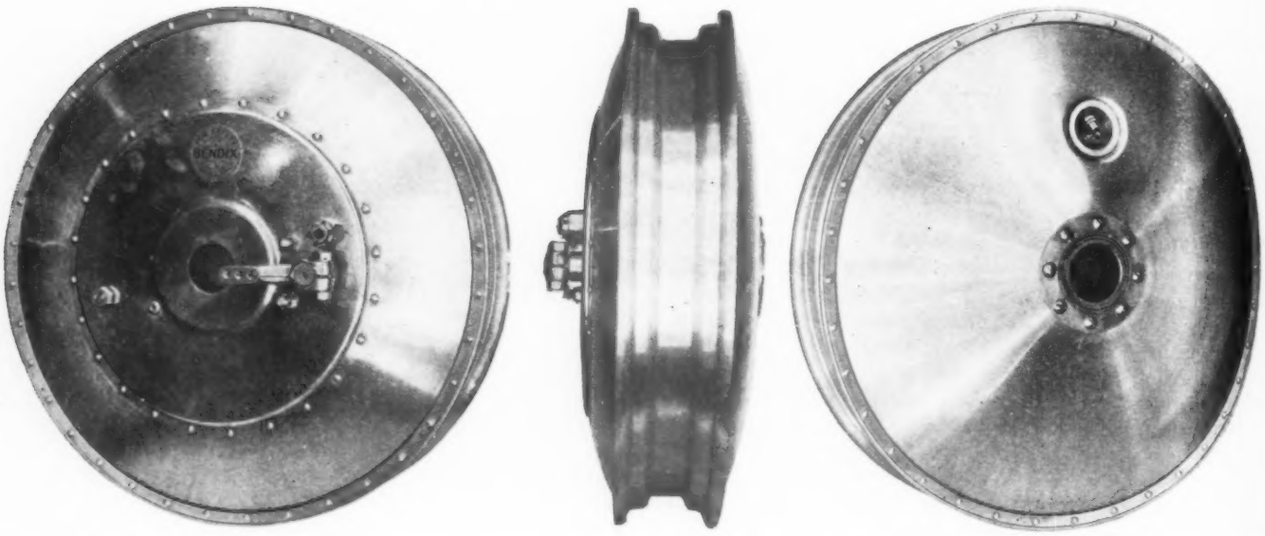
Planes must be registered as "an aircraft of the United States of America" by already existent rules of the Department of Commerce and pilots who operate them must obtain licenses from the department as "transport pilots" or as "limited commercial pilots". Traffic rules of the air also are provided in the new San Antonio ordinance. Acrobatic flying is prohibited and a fine of $200 is provided for violation of any section of the ordinance. Acting Mayor Wright said the ordinance would be strictly enforced.

Nibbling Machine Saves Time

THE TIME taken to cut intricate shapes out of sheet metal can be considerably reduced by the use of a "nibbling machine". The usual procedure in cutting odd shapes is to drill a number of holes and saw and file between them. This method is eliminated by the use of a nibbling machine now being produced by Andrew C. Campbell, Inc., of Bridgeport, Conn., an associate company of the American Chain Co., Inc. Nibbling machines of various sizes are produced from ¼ to 1 hp. The machines can cut metal from 3/32 in. to ⅜ in. thick and mill steel at from 20 to 60 linear inches per minute. The principle of operation is the punch and die, blanking out small holes at a high speed.

The Bendix Wheel and Brake

Complete Brake and Disc Wheel Unit is Now on Regular Production Basis



Left: The brake side of the Bendix wheel. Center, front view of the 30 x 5 Bendix wheel and brake assembled. Right, side view of the Bendix unit away from the brake drum.

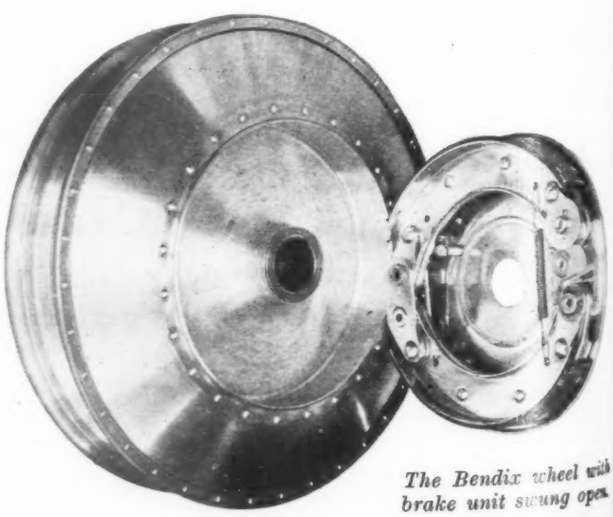
AFTER EXTENSIVE experimentation and development the Bendix Brake Co., South Bend, Ind., has started manufacture and shipment on a production scale of its first airplane wheel and brake. The brake is a complete unit contained in a disc wheel. It is a special two shoe servo brake developed for airplane work from the original Perrot two shoe brake. A number of tests made on production wheels were approved by the U. S. Army Air Corps. According to the manufacturer, Bendix wheels are standard equipment on Fairchild monoplanes and are already in production for a number of other reputable aircraft companies.

First Production Shipments Oct. 1

Some time ago the company decided that an airplane brake should be a complete unit included with the wheel and for that reason development was carried on with a disc wheel unit incorporating a brake. At that time I. M. Laddon, who was connected with the U. S. Army Air Corps at McCook Field, had designed and tested an improved disc wheel of this type. In January of this year, after negotiations had been carried through, the Bendix company took over Mr. Laddon's rights in this disc wheel and incorporated with it a special two shoe servo brake. The period from January to the first of October of this year has been occupied with the preparation for production. During that time tools, jigs, etc. were prepared until now the organization can produce both wheels and brakes on a production basis in addition to carrying on its regular testing and research. On Oct. 1 the first production shipments were made.

The Bendix brake was designed with a view to obtaining maximum strength with a minimum weight. It is made entirely of aluminum stampings except for the anchor pin, nuts, cam shaft and a few other small parts. The hub and drum, which are parts of the wheel, are integral being a heat treated aluminum casting while the dises, rims, and other parts are of aluminum alloy stock.

The Brake is mounted on the cover plate which forms a construction of the inside disc of the wheel. As the unit is entirely contained within the wheel it was possible to give the wheel a good streamline form reducing the air resistance to



The Bendix wheel with brake unit swung open.

a minimum. Besides the hub the only break in the form of the wheel is the valve stem and the brake lever on the cam shaft. The opening required for the valve stem is through a hemispherical cup on the outside of the wheel or, the side opposite to that of the brake mechanism. The valve consists of a short straight extension connected to the standard 45 deg. valve stem. This extension is used to hold the hemispherical cup in place through the medium of a soft rubber faced metal washer. This provides a water tight seal for the only opening in the wheel when the tire is on.

The wheel is riveted with a reinforcing ring at the rim of the wheel. This type of construction gives a wheel that is very strong, light and yet simple in construction.

Brake Action Simple

The action of the brake is very simple; a cam rotating in the same direction as the wheel, forces one of the shoes against the drum. This in turn forces the other shoe against the drum. After extensive tests it was found that a breaking action directly on the surface of the heat treated aluminum brake drum is entirely satisfactory provided adequate braking area is used. Roller cam followers are used, giving a simple mechanism that is quite sturdy and efficient. As in the Bendix automobile brake, adjustment is from the outside by means of a secondary shoe adjustment (through a nut) or by changing the position of the actuating lever on the camshaft.

Bendix wheels and brakes are now being produced in four sizes; 30 by 5, 32 by 6, 36 by 8, and 44 by 10. A fifth size of 54 by 12 is being developed for very large airplanes and will soon be on the market. Bendix wheels are available with or without brakes, the wheels without brakes being available for special purposes. The manufacturer claims that they are the lightest airplane wheels ever built. The following list gives details of the sizes of wheels and brakes with their strength and weight.

Size		Approximate Weight		Strength		Maximum
Wheel	Brake	Plain	Brake	Radial	Side	Weight Plane
30x5	12 in.	13 lb.	22 lb.	13000	4000	3500 lb.
32x6	12 in.	18 lb.	30 lb.	23000	5000	
36x8	12 in.	20 lb.	31 lb.	23000	6100	9000 lb.
44x10	20 in.	36 lb.	60 lb.	35000	10000	14000 lb.

It is stated that the test figures are conservative, taken from official tests actually made on production wheels.

Mail Service for San Antonio

FOLLOWING A recent visit to San Antonio, Tex., by C. A. Winder of Fort Worth, representing the Texas Air Transport and A. B. Spencer, manager of the Fort Worth Chamber of Commerce, announcement was made by Porter Whaley, manager of the local chamber of commerce, that air mail service would be available in San Antonio by Dec. 15.

The service will connect with the Dallas-Fort Worth line to Chicago. The Fort Worth men inspected Winburn Field which will be used as the local airport and pronounced it satisfactory except for hangar accommodations. Plans for construction of an additional hangar are now being discussed by the city.

New Firm Takes Over Business

THE AIRPLANE business of Charles Ward Hall, Inc., has been taken over by the new Hall-Aluminum Aircraft Corp. This company will manufacture all-metal aircraft, both land planes and seaplanes. In addition it will make standardized drawn sections and stamped parts.

The New York offices of the Hall-Aluminum Aircraft Corp. will be at 156 East 42nd St. The plants will be located at Mamaroneck, N. Y., and 2,000 Elmwood Ave., Buffalo, N. Y.

Ryan Brougham for New Zealand

INTEREST IN aviation in Australia is increasing at a tremendous rate and it is expected that within a short time large shipments of airplanes from the United States will be made to that country, E. A. Chaseling, associate of the Institute of Aeronautical Engineers of Sidney, Australia, told a representative of AVIATION at San Diego, Calif., recently.

Mr. Chaseling went to San Diego with George E. Roberts, San Francisco exporter, the latter having purchased a new

E. A. Chaseling and George E. Roberts in front of a Ryan Brougham.

Ryan monoplane from the B. F. Mahoney Aircraft Corp. for shipment to Wellington, New Zealand. Mr. Chaseling is one of the foremost aviators in Australia.

The purcasers of the plane have not been made known. It is known however, that the plane will be flown in an attempted non-stop flight from New Zealand to Australia, a distance of 1360 mi.

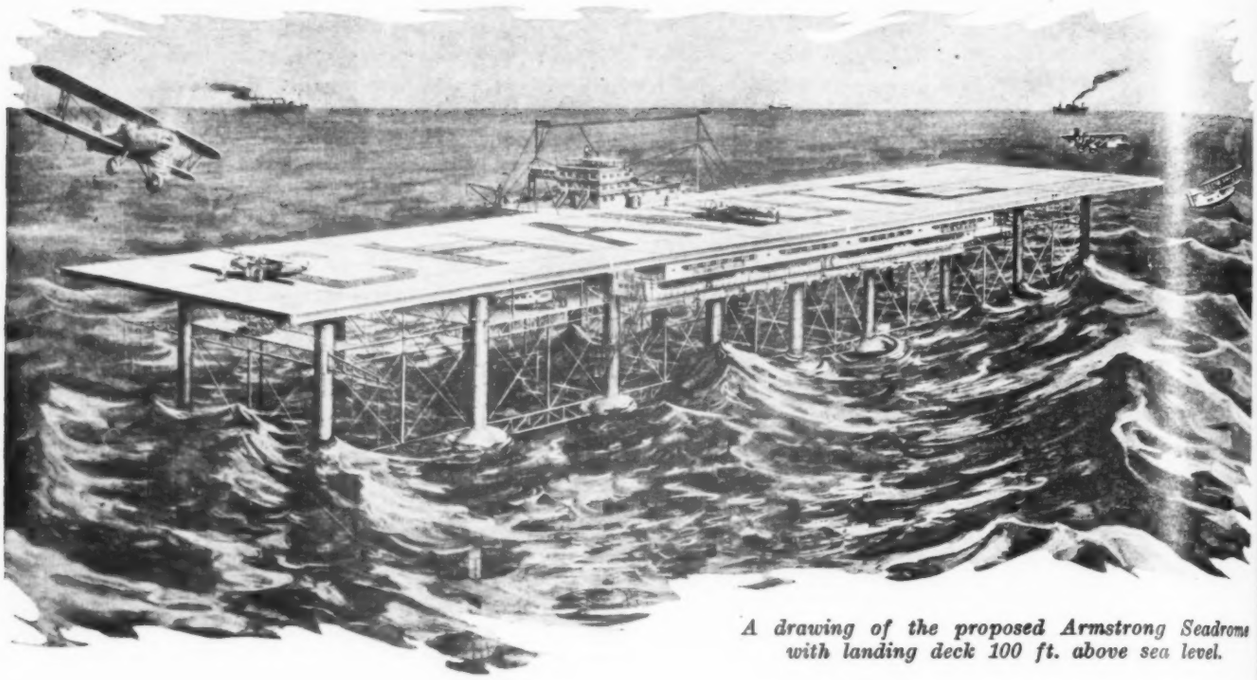
"Everybody in Australia is enthusiastic over flying," said Mr. Chaseling. "Every flying field has a waiting list of students all anxious to learn to fly. From all indications the demand for training planes is so great that United States must be called upon to supply it."

Mr. Chaseling has just conducted a visit to eastern aircraft manufacturing plants and has inspected and flown several types of planes. Mr. Roberts, the broker, shipped the plane to New Zealand early this month.

Increased Use of Flightex

THE E. S. Twining Co. of New York City, that markets the well known Flightex Fabric for covering aircraft, reports a great increase in the demand for its high grade fabrics. The Flightex and special processed fabrics are being used on a large number of the commercial aircraft being built in this country as well as on the aircraft for the government services.

The eight transport monoplanes built by the Travel Air Manufacturing Co. of Wichita, Kan., for the National Air Transport were covered with Flightex Fabric. These planes are in service daily between Chicago and Dallas, Texas, carrying passengers in addition to mail and express. The two famous Trans-Pacific Travel Air monoplanes, one flown by Smith and Bronte and the other flown by "Art" Goebel, were covered with Flightex fabric.



A drawing of the proposed Armstrong Seadrome with landing deck 100 ft. above sea level.

Seadromes *and* Ocean Flying

Increasing the Safety Factors of Water Flying With Floating Landing Fields

By E. R. ARMSTRONG

THE OUTSTANDING experiences of trans-oceanic fliers over the North Atlantic route is the extreme flight hazard brought about because of weather conditions. Advance weather information which is absolutely essential for safe flying cannot be forecasted over the trans-Atlantic route without sea stations for the collection of information. The wide expanse of ocean covered by an airplane in twenty-four hours, makes it impossible to tell at the start of a trip what the weather will be at the other side of the ocean, thirty hours later at the end of the voyage. It would be of little value to an American pilot to know mid-way on his flight that when he arrived at the English or French coast it would be too stormy or foggy to land. Hinton, Lindbergh, Byrd and Chamberlin, the men who have flown the Atlantic, are as one in emphasizing the absolute necessity of "sea stations", "floating islands", "seadromes" call them what you will, they insist that they must be an integral part of any system of safe commercial ocean transit by airplane.

In 1913 the writer made a study to determine where the airplane would eventually prove of most value from a transportation point of view. In summation it appeared that the trans-Atlantic route between America and Europe offered the most attractive airway development. Over it the largest number of people travel the greatest distance by relatively a slow method of transportation. As a result the development of a seadrome system of anchored refueling and serviceing stations was started, to permit the economic use of the airplane on this route. A seadrome has been designed and tested that fulfills all the requirements of such a structure. An anchoring system has been designed and is now to be tested under actual working conditions. According to the development schedule now being carried out a trans-Atlantic Airway will be in operation by 1930.

May Reduce Forced Landings

The United States Post Office operation of the transcontinental air mail is the outstanding example of the most perfect air route development in the world. The National Air Transport, Chicago-Dallas Airway, while only one-third as long as the New York-Frisco line, equaled, if it did not exceed, during its first year of operation, the on time performance and perfect score of the trans-continental air mail. National Air Transport with a more nearly one hundred per cent performance than the air mail experienced a forced landing due to weather causes per each 7,000 miles flown. Mechanical failures caused only one-fifth as many forced landings as bad weather. Improvement in planes and the skill of pilots may reduce the many forced landings now necessary for safety.

Keeping in mind for the moment that both the airways

cited have refueling and inspection stations not exceeding 250 miles apart, it is not illogical to forecast for a regularly operated trans-Atlantic route with terminals at Newfoundland and Ireland and no intermediate stops, a forced landing rate of similar or greater frequency. Weather conditions that will adversely effect flying are considerably more prevalent on the Atlantic route given, than on the Chicago-Dallas route. It must be accepted then as very probable that for every four trans-Atlantic trips at least one will encounter conditions where a forced landing due to weather should be made. Continued flight necessary by the lack of stations could lead only to disaster. The inability to exactly forecast weather over the North Atlantic will undoubtedly greatly increase the operating hazard as compared to the land route. Obviously if twenty-five per cent. of trans-oceanic trips are accompanied by forced landings in the stormy Atlantic it would prove an impossible commercial venture, even ten per cent. or probably one per cent. forced landings would condemn the service.

Flying the Atlantic commercially demands from its inception the highest degree of safety in operation. The Newfoundland route is ruled out on the basic consideration that it can never be safe, from a weather point of view. Storms are frequent and violent, fogs, sleet, ice and snow are prevalent during the greater portion of the year. The only redeeming feature of the route is that it is the shortest ocean crossing although it is much too long for economical airplane operation. Considerations such as these, and others just as basic, developed by the writer as far back as 1913, started the development of the seadrome system of anchored airplane supply and navigating stations, where planes could be refueled, inspected, repaired and stored and the many functions and operations normally attached to a land airdrome could be carried on.

Weather Determines Seadrome Locations

Conceding for the moment the possibility and practicability of deep sea anchorages, the construction of storm-proof seadromes unaffected by waves, of adequate area for an ocean airplane landing field, it is at once apparent that the most favorable trans-Atlantic route can be selected from a weather and operating point of view, and stations spaced at such distances apart as may be determined as necessary for safety and economy in airplane transport.

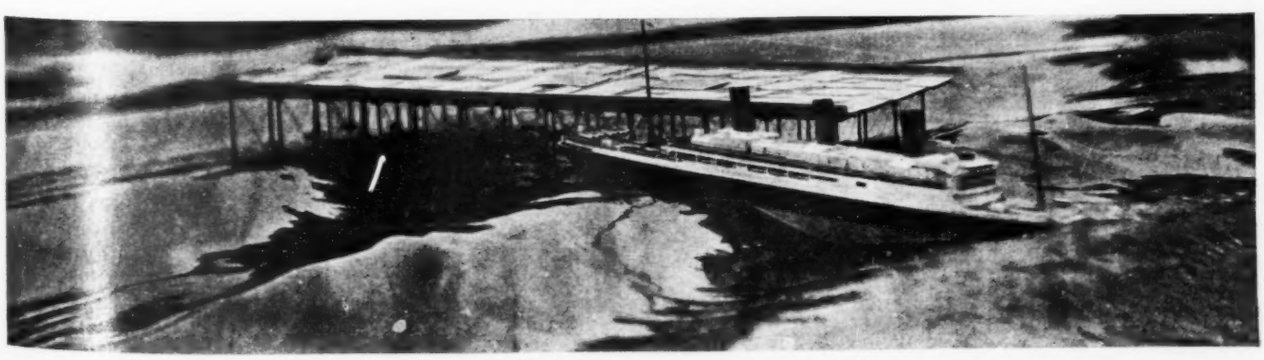
Before considering the equipment comprising a practical seadrome system capable of performing a definite transport service, an estimate of the possible traffic that would be available on a trans-Atlantic air route between the United States and Europe will be given. The trans-Atlantic airway has the possibility of becoming the best patronized and most profitable of any airway the world over. Approximately 2,000,000 passengers make the ocean crossing annually, equal to the total passenger mileage of the Pennsylvania Railroad. First class mail exceeds 10,000,000 pounds per year, second class mail 100,000,000 pounds, express considerably exceeding the latter amount. Careful income estimates based on approximately half of the trans-oceanic transportation going by air at rates that would attract it and made possible by seadromes, the gross income as an air transport operation will exceed $500,000,000 annually, certainly a figure the combined airways of the world will require many years to attain. Commercially then the trans-Atlantic airway will well repay development.

Water Craft for Rescue Work

Weather conditions that would make advisable a flight interruption on the Atlantic route would frequently be accompanied by sea conditions that would make a sea landing by an airplane a hazardous operation while take-off under such conditions would be impossible even with the largest flying boats. On this basic assumption the Armstrong Seadrome was designed for deck landing and take-off of planes. Sea landings of the flying equipment normally using the system will be possible but accidental. It is quite practical to design planes with boat like body shapes with excellent seaworthy qualities if sea take-off is not necessary. With stations spaced but 400 miles apart with one intermediate station in between, forced landing on the ocean would permit of effective sea patrol service reaching the disabled plane via air in less than two hours and by surface craft located at the main and intermediate stations in about four hours. It is also obvious that many of the forced landings that would occur on the Newfoundland route would not happen in the southern route because weather forecasting would control flying schedules with the result that when bad weather occurred planes on that section of the route would be held at the stations until flight could be resumed with safety. In addition the weather hazards experienced on the Newfoundland route are much less prevalent on the more southerly route selected, so that storms will be encountered with but ten per cent. of the frequency with ice and fog almost never encountered.

Seadromes then must be of adequate area suitable for landing and take-off of the largest transport planes. In addition they must be storm proof without appreciable roll or pitch when subjected to the largest waves of the Atlantic, further they must be securely anchored on the route selected and finally the capital cost and maintenance expense should be such as to permit a substantial return on capital investment with cost of transportation about that charged on the high speed steamships.

The deck area required for normal landing and take-off of transport planes may be estimated in accordance with the



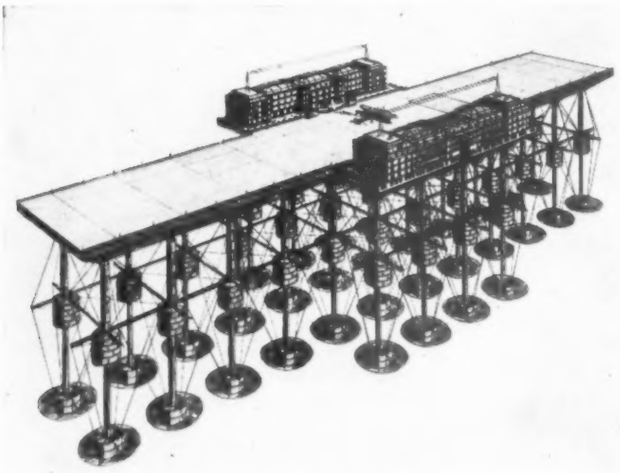
Illustrating the stability of the Armstrong Seadrome in rough weather with a scale model of the S.S. Majestic

experiments conducted under the auspices of the National Advisory Committee for Aeronautics, Report Number 249, With arresting and launching gear, space requirements may be reduced, but not in the writers opinion, much below the 1200 ft. length of deck, 200 ft. wide shown in the proposed design.

Ships of the airplane carrier type have been suggested as ocean airway stations. The size necessary to give adequate deck area for landing large transport planes would have a displacement of approximately 60,000 tons, costing at least $15,000,000 each ($250 per ton). Neglecting for the moment the fact that any normal ship structure floating in waves would be a very unstable platform for landing on with big planes, their cost would be prohibitive and their anchorage almost an impossibility.

Wave Characteristics Studied

In working out a solution of the problem of establishing anchored ocean airway stations an investigation was made of the origin, propogation and reactions of ocean waves to determine whether or not it was possible to design a floating structure that would be unaffected by them. The result has been the development of the design shown herewith and which has been demonstrated by model tests to be practically unaffected by waves. Ocean waves which are built up by the wind, do not as far as practical results are concerned, create any disturbance fifty feet below normal sea level, so if an open work structure is designed to float with approximately 85 per cent. of its displacement below the wave disturbance line with displacement units far enough apart to give discontinuity, and so shaped as to offer the minimum resistance to wave action, the effect of the waves to roll and pitch it would be very much minimized. Actually in the



Out of water view of the Armstrong Seadrome for trans-oceanic airways.

seadrome design shown, which has been thoroughly tested in model form, in wind and waves, duplicating as far as possible those that would be met with at sea, proved to be without roll or pitch even in waves equivalent to 120 ft. in height, at least three times higher than those ever recorded by marine observers on the North Atlantic.

The landing deck is about 100 ft. above sea level while the draft is approximately 170 ft., special construction being used to permit of erection in water 30 ft. deep, each buoyancy chamber is sub-divided into eight watertight compartments, some of which are used variously for oil and water storage, as well as ballast to maintain trim and desired displacement. For each station about 10,000 tons of steel will be required which will cost erected with necessary equipment $150 per ton or a total of $1,500,000, about one-tenth the cost of a ship structure of approximately the same deck landing space.

Below the landing deck is the service deck, 900 ft. long and 120 ft. wide, free from obstruction of any kind. Four hangars are located in the central section adjacent to the service deck. Each hangar is 100 ft. by 80 ft. with 20 ft. head room. Shop and storage space is provided for repair and storage of parts and supplies. Hotel accommodations more or less elaborate as may be required by the service are planned for both the operating personnel of approximately 125 people totalling, with an equal number of transient guests, 250 for each station. Meteorological and radio departments collecting and broadcasting weather information aside from their special duty of forecasting safe flying conditions will provide a valuable service to shipping, not now possible. The radio beacon, fog dispersion over stations by electrical means, international radio broadcasting are just a few of the immediate possibilities of the seadrome system.

The development work that has been done to date has technically proven that seadromes are practical engineering structures whose behavior at sea can be determined in advance with sufficient accuracy to insure their successful working after construction.

Tests Being Conducted

The anchoring system devised for securing the seadromes at definite locations on the route selected appears entirely feasable from an engineering point of view. Whether or not it will operate for an indefinite period year in and year out, under all conditions of wind and weather can only be determined by actual experiments. It is this phase of the development that is now to be tested. A test unit, a part of a full sized seadrome has been designed to be anchored on the route selected in water three miles deep, the deepest anchorage that is contemplated. The experimental station location is almost due east from New York about 550 miles out, and in addition to being the deepest anchorage the location selected is subject to the worst weather conditions, exceeding in severity any met with at any of the seadrome sites on the trans-Atlantic route. Construction of the test station will be started some time in August and completed in time to be thoroughly tested by the fall and winter storms of 1927-1928.

It is believed that sufficient design information will be accumulated by spring to permit of starting the full size seadromes with the probablity that a commercial trans-Atlantic airway will be in operation in 1930.

N.A.C.A. Publishes Report No. 271

THE NATIONAL Advisory Committee for Aeronautics recently published report No. 271 entitled "Pressure Distribution Tests on PW-9 Wing Models Showing the Effects of Biplane Interference", by A. J. Fairbanks. The report describes results of tests on the wing models individually and in the biplane combination in the N.A.C.A. atmospheric wind tunnel. The conclusions drawn from these tests are that the biplane interference on the pressures on the wings is practically confined to the lower surface of the upper wing and the upper surface of the lower wing; that the overhanging portion of the upper wing is not greatly affected by the presence of the lower wing. It is also shown that a slight wash-in at the center section of the upper wing satisfactorily compensates for a reduced chord at this section (providing the airfoil is not mutilated) and prevents a large reduction in the normal force over this portion of the wing.

Front quarter view of the Ireland "Neptune" amphibian.

The Ireland Amphibian

A Five Place Open Cockpit Biplane Powered With a Whirlwind Engine

IRELAND AIRCRAFT, Inc., of Garden City, N. Y., recently made test flights on its latest product, a conventional amphibian flying boat powered with a Wright Whirlwind engine mounted below the upper wing. The Ireland "Neptune" is a five-place open cockpit biplane with pilot and passengers sitting in the hull. There are two cockpits, the forward one being fitted with dual side by side control and the rear one with a seat wide enough for three passengers with room for a moderate amount of baggage. The hull has a wood frame with a covering of sheet duralumin bolted and screwed to the wood members. The wings are of wood covered with fabric in the usual manner.

Wing Structure Similar to the "Meteor"

The wings on the Neptune are very similar in structure to those used on the Ireland "Meteor". They have box type "I" section spars with spruce flanges nailed and glued to two ply spruce webs. (On the later planes it is expected that the spars will be of solid routed section.) This flange decreases in width beyond the outer strut point giving a simple box beam for the overhang. The box spars are filled with blocks in the conventional manner at the fittings. The ribs are built up into a truss with three ply spruce cap strips and three square vertical members between the cap strips in addition to two diagonal braces of ¾ in. by ⅛ in. spruce extending from the bottom of the spars to the mid-point of the upper cap strip. There are vertical strips of veneer on each side of the spars. The entire rib is reinforced at the joints and at the leading edge by veneer gussets. Though the ribs are quite light they have been tested and found to be of sufficient strength. The compression members in the drag truss are duralumin tubes, protected against corrosion with "Rust-Veto". Beams are reinforced against torsion at the strut points by ribs of standard construction except that the plywood gussets are replaced by a solid sheet of plywood shaped, of course, to conform to the wing section. At each side of the fuselage, in order to reinforce the wing for a side walk, the ribs have a solid mahogany plywood web with no supplementary bracing. Conventional heavy wire is used for the diagonal bracing to take the drag loads. All of the fittings are built up of welded flat members and have high strength factors. The wings are fabric covered and finished with four coats of clear dope and two of pigmented dope. Perforations along the trailing edge are provided at intervals to drain the wing of any water that it may absorb.

The interplane bracing is by streamline duralumin struts

The "Neptune" taxiing on the water.

and conventional wire bracing. Wire is used for incidence bracing at the outboard struts while N struts are used at the center section. Due to the engine being mounted below the center section these struts are braced forward to the hull rather than in the usual manner between the wing spars. In addition round steel tubes are welded and bolted to the rear center section beam to form a support for the engine mount. The engine mount for the Wright Whirlwind engine is the conventional welded circular tube of unusually large diameter and wall thickness. Bolted to the main struts are steps to provide a place to stand while making engine adjustments

Showing the folded landing gear and a section of the hull deck on the Ireland "Neptune" amphibian.

or repairs. Any doubts that may have been held about the cooling of the Whirlwind engine when mounted as a pusher have been entirely dispelled and, according to tests by the Ireland Aircraft, Inc., the engine cools perfectly even under runs of 45 min. on the ground, and gives promise of satisfaction under long periods of taxiing on the water.

The center section is built entirely of metal with spars of oval section steel tubing and duralumin ribs. In this center section is a gasoline tank of five gallons, with fuel pumped to it from a main tank in the fuselage by an engine driven pump supplemented by a hand wobble pump for use in case of an emergency.

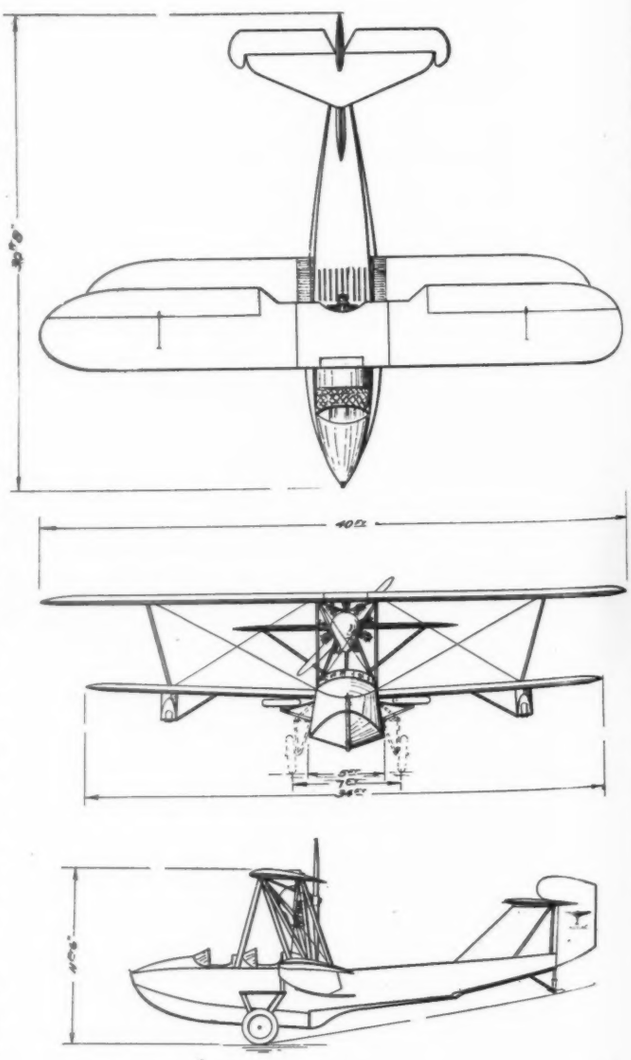
Storage Compartment in Nose

The hull is of two step construction with the rear step being quite small and of the closed type. The general outline of the hull is such that it has a good streamline form and yet gives the flying boat such qualities that are necessary to make it seaworthy and navigable on the surface. As has been mentioned before there are two cockpits, the forward one being fitted with dual side by side control while the rear cockpit is wide enough for three passengers. In front of the forward cockpit at the very nose of the hull is a compartment for the storage of an anchor or any other equipment. Around the side of the hull is a narrow shelf or deck. This walk is very handy for mooring or getting in or about the hull. It consists of a duralumin channel filled with wood and covered with a sheet of duralumin on each side. The walk is braced from the sides of the hull by steel tubes. In addition to the conventional spray strip at the chine this walk will tend to keep the open cockpits dry. The spray strips are of 1/8 in. duralumin fastened with wood and machine screws to the chine. Each cockpit is provided with a wide wind shield.

The forward cockpit is provided with the Deperdussin type control with the entire mechanism behind the instrument board. The wheels are mounted on a square tube that slides through a duralumin drum carrying the aileron cables. This square rod through a yoke actuates a cable connected to the el vator controls. The rudder control pedals are of the stirrup type with cables attached and passing over micarta pulleys to the rudder. There are two shafts running across the cockpit with the two left pedals attached to one and the two right pedals attached to the other. By having gears at the end of each shaft in mesh, a balance cable is eliminated. The horizontal stabilizer is adjustable by a sprocket and chain in the cockpit and another in the empennage. A rod turned by the sprocket and having a triple Acme thread moves the stabilizer; the device is self locking. The engine controls are by cables throngh Arens controls.

In front of the seats is an instrument board with the main instruments all under a single glass pannel, similar to that used on automobiles. The panel is indirectly lighted reducing the glare to a minimum. This instrument arrangement is known as the "Unit Control" board and is manufactured by the Elgin National Watch Co. The throttle and mixture controls are in the center so arranged that they cannot be accidently opened or closed by catching on to anything one's clothing.

The rear cockpit is quite large with ample room below the passenger's seat for baggage. In back of the rear cockpit in the hull and just below the engine is the main fuel tank of 66 gal. on the center of gravity. The tank is of duralumin with riveted rolled lap seams filled with gasket packing. The deck of the hull above the tank has a number of paral-



Three view drawing of the Ireland "Neptune" amphibian.

lel wood stringers to provide a firm footing when making engine adjustments.

The structure of the hull is of wood members, ash longerons and spruce bracing, with steel and duralumin fittings. The covering is of duralumin attached by steel wood and machine screws cadmium plated to prevent corrosion; the covering is attached with wood screws except at the fittings where bolts are used. Cloth impregnated in marine glue is used in all of the joints to keep them watertight. The interior of the hull is finished in "Rust-Veto" with all steel parts cadmium plated. Farina green Berryloid is used for the finish of the exterior of the hull.

Fitted With Additional Shackle

There are many interesting features about the hull that tend to make for easier handling of the plane when not under its own power. In addition to the customary shackle at the nose for mooring there is another shackle or ring on the keel below the water line to provide a low attachment point for towing. On the keel just in front of the step is a heavy steel shoe. By letting the weight of the plane rest on this shoe the plane can be easily swiveled about this point to turn it around. Behind the step, from the bottom are two breathers extending to the upper deck ventilating the step.

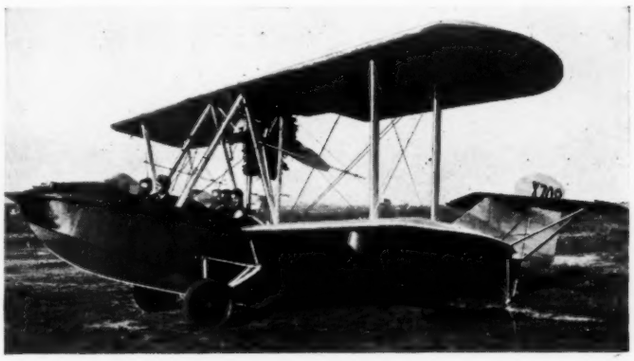
The wing tip floats are similar to construction to the hull. They are fastened just below the outboard wing struts and fitted with ash skids to protect the floats when taxiing on the ground.

Across the hull to support the seats are two 1¾ in. diameter duralumin tubes that also take the compression loads of the landing gear. The landing gear truss hinges on the side of the hull; the truss consists of a tripod with the forward member in compression and carrying the oleo mechanism. Two of the members of the tripod are hinged at the hull while the other member is attached by a universal joint to a sliding strut that makes the landing gear retractable. This strut is controlled by cables actuated by a rachet and worm mechanism turning a drum. The ratchet, which is between the seats in the forward cockpit, is self locking in any position and in addition the strut slides into a hook-like fitting at the end of its travel, thus doubly assuring that the landing gear is locked in place. The double cables, that actuate the landing gear mechanism are just in front of the lower forward wing spar in the hull. Incidentally this beam or spar is of box section. It is estimated that the wheels can be drawn up in about 30 sec. and lowered in 20 sec. The under carriage has been tested at 50 per cent. over load with a drop of 33 in. The tail skid is provided with the same type of oleo mechanism with an air vent to prevent the oil from leaking out. The travel of the tail skid is five inches while that of the landing gear is nine inches.

Side view of the Ireland "Neptune" amphibian on the ground.

The ailerons and tail surfaces are of welded steel tubes for the ribs and spars, with a channel leading edge. The hinges consist of a duralumin fitting attached to the spar and having a brass hinge strip. All of the control surfaces have been statically tested well above the required load. The tail surfaces are balanced and set high above the water in the slipstream.

A somewhat surprising feature of the plane is its unusual maneuverability on the ground. Taxiing at a speed of one to two miles an hour, by giving hard rudder and "gunning" the motor it can be turned so sharply that the wheels will skid sideways across the ground. In the air it shows exceptional effectiveness on all the controls.



Front quarter view of the "Neptune" showing the seating arrangement of five persons.

The tendency to stall with the power off displayed by many boats has been entirely eliminated. By properly adjusting the stabilizer the "Neptune" may be flown "hands off" under any condition of loading. Put into a normal glide, it remains there without further effort on the part of the pilot.

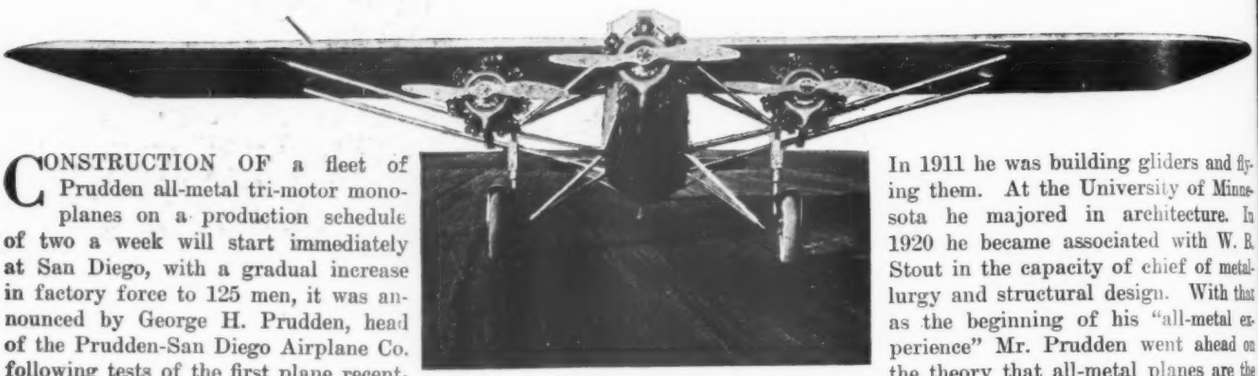
The specifications for the Ireland Neptune as supplied by the manufacturer are as follows:

Span upper wing	40 ft.
Span lower wing	34 ft.
Chord	5 ft. 6 in.
Wing area, including ailerons	350 sq. ft.
Airfoil	Curtiss C-72
Length	30 ft. 6 in.
Height, on wheels	11 ft. 6 in.
Tread	7 ft.
Width of hull at forward step	5 ft.
Aileron area	48 sq. ft.
Horizontal tail area	46 sq. ft.
Vertical tail area	32 sq. ft.
Weight empty	2000 lb.
Pay load	750 lb.
Useful load	1358 lb.
Normal gross weight, fully loaded	3358 lb.
High speed at sea level, full load	99 m.p.h.
Cruising speed, full load	85 m.p.h.
Landing speed, full load	46 m.p.h.
Climb at sea level, full load	650 f.p.m.
Climb to 10,000 ft. full load	35 min.
Service ceiling	11,000 ft.
Absolute ceiling	12,000 ft.
Fuel capacity	71 gal.
Normal range	500 mi.
Engine	Wright J-5-C
Propeller	Curtiss Reed 9 ft. dia.

The first one of these amphibians has been purchased by the Curtiss Flying Service, Inc., and will be used in regular service by that company.

New Prudden Plane Tested

Six Passenger, All-Metal, Trimotor Monoplane Has Many Interesting Features



Front view of the Prudden all-metal trimotor monoplane manufactured by the Prudden-San Diego Airplane Company.

CONSTRUCTION OF a fleet of Prudden all-metal tri-motor monoplanes on a production schedule of two a week will start immediately at San Diego, with a gradual increase in factory force to 125 men, it was announced by George H. Prudden, head of the Prudden-San Diego Airplane Co. following tests of the first plane recently.

Mr. Prudden has just perfected a six-passenger plane designed principally for commercial passenger service or for business men and sportsmen who feel the urge for travelling long distances quickly. The new monoplane cruises at a speed of 100 m.p.h. with full load and has a circulating radius of 450 mi. without landing. The plane is 35 ft. long, has a wing spread of 52 ft. and stands 10 ft. high. It weighs 2250 lb. and lifts 1500 lb. more with ease. It takes off in 400 ft. with a full load and lands at a speed of approximately 45 m.p.h.

Among the special features of the new plane are the use of triplex safety glass, which is non-shatterable, Gruss air shock absorbers, brakes and Pyrene pressure fire protection to all three engines. The plane will carry six passengers and its pilot in a cabin in comfortable wicker chairs, with upholstered walls and ceiling. Abaft of the passenger's cabin is a lavatory, together with other conveniences for modern air travel. The useful load of the plane for freight and passenger capacity will be determined exactly in later tests.

Embodies Latest Safety Developments

The new Prudden plane embodies the latest safety developments known in airplane manufacture. Three Ryan-Siemens radial air-cooled engines of 125 hp. each supply the propelling force. It is claimed that the plane is so balanced that it can cruise easily on any two engines, or glide for at least 40 miles with one engine running. The engines have a small amount of vibration and, according to those who have watched the plane in tests at San Diego, make a combined noise less than some single-engined planes.

The plane is made entirely of corrugated duralumin, and the strength of this metal is said to make the plane practically crash-proof. In addition, huge shock absorbers on the split type landing gear and on the tail skid make it difficult for the passengers to detect any jolt when the plane settles to the ground. The visibility is stressed by the manufacturers as one of the plane's most important points. According to Mr. Prudden the visibility is greater than in any previous plane.

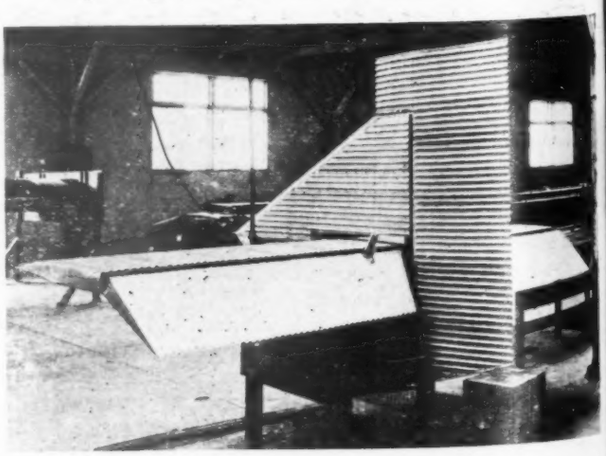
Mr. Prudden has been an airplane designer since boyhood. In 1911 he was building gliders and flying them. At the University of Minnesota he majored in architecture. In 1920 he became associated with W. B. Stout in the capacity of chief of metallurgy and structural design. With that as the beginning of his "all-metal experience" Mr. Prudden went ahead on the theory that all-metal planes are the coming craft of the air, and now heads his own company.

"In the new tri-engine all-metal monoplane", said Mr. Prudden to a representative of AVIATION, "three factors of safety should appeal to the user of airplanes. This plane will be powered by three engines, will be all-metal and will be fireproof. The danger of forced landings will be considerably reduced by the ability of the plane to cruise any reasonable distance to a suitable landing field.

"Its service will be longer than that of a motor car. The metal is practically non-corrosive. No vibration comes to the ears of passengers from the engine or any other source. The engines and parts are easily accessible."

Many Enquiries Received

Other features of the plane emphasized by the manufacturers are: roomy and easily accessible cabin, comfortable seats, luxurious upholstery, pleasing lines, unequalled visibility, freedom from noise, no vibration, steady and smooth in flight, lavatory, perfect balance, soft and smooth in landing, sturdy and strong. The plane has been designed for use on passenger, freight and express lines, as well as for



Tail section of the Prudden all-metal monoplane

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other purposes, and judging by the many inquiries received at the factory will find a ready market.

Backers and directors of the Prudden-San Diego Airplane Company are Geo. H. Prudden; B. W. Sinclair, former Ford dealer and San Diego capitalist; Bruce Starke, president of the Western Metal Supply Co. of San Diego; C. O. Richards, Herbert Richards and Philip Bartlett, capitalists; Ed Fletcher, land owner, and Bradley Tyrell, president of the Southlands Corp.

Side view of the Prudden all-metal trimotor monoplane

The plane was put through a series of tests by Lieut. Ray Clark of the Army Air Corps, who acted as test pilot. Present plans call for two more planes to be built immediately, after which the factory will be running on a schedule.

A complete technical description of the Prudden All-Metal Monoplane will appear in an early issue of AVIATION.

Novel Taxi Service Rate Card

THE VON Hoffmann Aircraft Company of St. Louis, has recently issued a card descriptive of its air taxi service. One of the features of this card is a table which is called "Examples of Time and Cost". This table gives an estimate of the number of hours required for an airplane trip from St. Louis to various points such as Chicago, New York, Kansas City, etc., with the time saving as compared with railroad transportation. An estimate is also made of the cost of the trip from St. Louis to these different points for one or more passengers. All charges entering into a trip are explained in detail on this card. Some of the rates are as low as 10c a mile. On round trips the passenger rate is 10c per mile, per person for a party of 4; 13c per mile, per person for a party of 3; 17c per mile, per person for a party of two and 30c per mile for a party of one.

Ryan Broughams are used in the Von Hoffmann taxi service. In addition to making long distance trips the company also conducts short flights over St. Louis and outlying points of interest.

New Royal Air Force Bomber

A RECENT report from Martlesham Heath, England, states that there is under construction in that locality a new giant bomber for the Royal Air Force. The plane, which is now nearing completion, weighs close to 20 tons with a wing span of 200 ft. It is powered by four engines developing 2,000 hp.

The machine, which is known as the "Flexible", was originally designed for passenger use but was taken over by the British Air Ministry as a bomber. As a passenger plane it can accommodate 35 or 40 passengers or as a bomber carry between four and five tons of bombs.

Colonel Lindbergh on Active Duty

COLONEL CHARLES A. Lindbergh is now on active duty in tactical training with the First Pursuit Group, Army Air Corps, stationed at Selfridge Field, near Detroit, Mich. He joined the Pursuit Group in gunnery exercises at Oscoda, Mich. Following graduation from the Advanced Flying School of the Air Corps at Kelly Field, Tex., on March 14, 1925, Colonel Lindbergh was on inactive status until July 5, 1925, when he was again assigned to active duty as a 2nd Lieutenant in the Air Corps Reserve at Richards Field, Kansas City, Mo., training with the Reserve officers in that vicinity.

The gunnery exercises at this time of the year afford to the Pursuit Group an opportunity to operate as a unit in the climatic conditions of Michigan which usually involves extremely cold weather and a ground covered with snow. In event of sufficient snowfall the planes will have their landing wheels removed and replaced by skiis, the planes taking off and landing on the surface of the snow.

Colonel Lindbergh's active duty will extend to the first of the year, which will give him an opportunity to be with the First Pursuit Group, not only at Oscoda, Mich., but after its return to Selfridge Field.

Plan Airship Line for 1928

ACCORDING TO a recent report an air route using two 5,000,000 cu. ft. dirigibles is to be established between England and New Zealand. The airships will each carry 100 passengers and will be powered with heavy oil engines. It is expected that the service will operate on a 12 day schedule.

The airships as proposed will follow the routes of the old sailing ships. South Africa, which has already ordered a mooring tower, is expected to be an important link in the system.

It is reported that model and full-scale research and experimental work in connection with the scheme has now been completed and it is anticipated that the home trials of two 5,000,000 cu. ft. airships would be finished early in 1928.

Ready to Go

Side view of the Curtiss O-11 "Falcon" observation plane with which the Air Corps units of the National Guard will soon be equipped. The engine is a 400 hp. Liberty. The first plane of this type was recently delivered to the Army for tests.

Significant !

THE ENGINEERING INDEX

(Registered United States, Great Britain and Canada)

Mechanical Engineering Section

THE ENGINEERING INDEX presents each month, in conveniently classified form, items descriptive of the articles appearing in the current issues of the world's engineering and scientific press of particular interest to mechanical engineers. At the end of the year the monthly instalments are combined along with items dealing with civil, electrical, mining and other branches of engineering, and published in book form, this annual volume having regularly appeared since 1906. In the preparation of the Index by the engineering staff of The American Society of Mechanical Engineers some 1200 technical publications received by the Engineering Societies Library (New York) are regularly reviewed, thus bringing the great resources of that library to the entire engineering profession.

Photoprint copies (white printing on a black background) of any of the articles listed in the Index may be obtained at a price of 25 cents a page. When ordering photoprints identify the article by quoting from the index item: (1) Title of article; (2) Name of periodical in which it appeared; (3) Volume, number, and date of publication of periodical; (4) Page numbers. A remittance of 25 cents a page should accompany the order. Orders should be sent to the Engineering Societies Library, 29 West 39th Street, New York.

AIRPLANE PROPELLERS

Design. Some Notes on the Design of Airscrews, F. S. Barnwell. Instn. Aeronautical Engrs.—Jl., vol. 1, no. 5, May 1927, pp. 56–77 and (discussion) 77–83, 6 figs. Deals with simple blade-element theory; means for determining effect of body on tractor air propeller and effect of air propeller on body; metal propellers.

Geared-Down. Geared Down Propellers and Efficiency of Commercial Airplanes, R. M. Mock. Aviation, vol. 22, no. 22, May 30, 1927, pp. 1137–1140. Better performance attained in spite of increased weight.

Metal. Metal Propeller Development, E. G. McCauley. Aviation, vol. 22, no. 22, May 30, 1927, pp. 1127–1130 and 1144, 10 figs. Extensive test work responsible for present efficiency of metal propellers for aircraft use; detachable blade; composition of aluminum alloy.

Sections. Characteristics of Propeller Sections Tested in the Variable Density Wind Tunnel, E. N. Jacobs. Nat. Advisory Committee for Aeronautics—Report, no. 259, 1927, 16 pp., 18 figs. Results obtained, besides providing data for design of propellers, should be of special interest because of opportunity afforded for study of scale effect on family of airfoil sections having different thickness ratios.

AIRPLANES

American. The Aircraft Industry at Bolling Field. Aviation, vol. 22, no. 20, May 16, 1927, pp. 1033–1038, 7 figs. 65 aircraft manufacturers exhibit at all-American aircraft display; review of exhibits indicates progressive state of industry; aircraft manufacturers.

American Eagle. The American Eagle Commercial Plane. Aviation, vol. 22, no. 23, June 6, 1927, p. 1240, 2 figs. Outstanding design that involves several individual and distinct features which reduce maintenance; direct steel-tubing aileron control is positive, control wires, pulleys and accompanying friction being wholly eliminated; tail skid can be removed to re-wrap shock cord by removing two bolts which are easily accessible.

Bach. The Bach C-S-1 Cabin Plane. Aviation, vol. 22, no. 22, May 30, 1927, p. 1135. Three-passenger enclosed-cabin machine designed for private owner; simplicity and ruggedness are features; powered by 120-hp. super Rhone radial air-cooled engine.

Bellanca. The History of the Columbia. Aviation, vol. 22, no. 26, June 27, 1927, pp. 1430–1431, 2 figs. Facts and figures on construction, performance and records of the New York-to-Germany plane.

Bonney Seagull. Bird-Like Design Features Bonney "Seagull." Aviation, vol. 22, no. 24, June 13, 1927, pp. 1290–1291, 3 figs. By reproducing same aerodynamic characteristics as those of gull, L. W. Bonney expects to give his plane similar performance; independent movement of wing sections; entire wing of duralumin; dual side-by-side control.

Canadian Industry. The Canadian Aircraft Industry. Aeroplane, vol. 32, no. 19, May 11, 1927, pp. 534, 543–544, 546 and 548, 5 figs. Types of planes developed in Canada.

Chance Vought. Chance Vought Products Maintain High Standard of Quality and Performance. Aviation, vol. 22, no. 24, June 13, 1927, pp. 1278–1279. From original VE-7 model to new "Corsair" which holds four world's records, soundness of design has been governing factor; Corsair is designed around

THE ENGINEERING INDEX appearing in the August 1927 issue of Mechanical Engineering, a monthly journal published by the American Society of Mechanical Engineers, described 56 articles pertaining to aircraft, aeronautics, etc. The articles were from "the current issues of world's engineering and scientific press." Below is an analysis of their origin:

AVIATION	24
Other American aeronautical publications	0
Foreign	20
Bulletins of N.A.C.A., etc.	5
American Publications other than aeronautical	7
Total	56

43% of all the articles pertaining to aircraft, aeronautics, etc., were from AVIATION.

67% of all these articles published in America were from AVIATION.

100% of these articles taken from the American aeronautical press came from AVIATION, or in other words, no other American paper dealing with aeronautics contained articles described in The Engineering Index.

The above example is significant. It is just another indication that AVIATION is the American authority dealing with the design, construction and operation of aircraft.

AVIATION is the only American aeronautical publication written exclusively for those in the aeronautical industry, and others seriously interested in aircraft and their operation.

Aviation Publishing Corporation, 250 West 57th Street, New York City.

AVIATION

The Oldest American Aeronautical Magazine

President Coolidge Entertains Sixteen Trans-Oceanic Fliers

ON NOV. 14, President Coolidge and official Washington honored the pilots and others who took part in this year's crossings or attempted crossings of the Atlantic and Pacific. The President entertained sixteen aerial pioneers at lunch at the White House and in the evening all were invited to see Col. Charles A. Lindbergh presented with the Hubbard Medal awarded by the National Geographic Society.

At the White House luncheon, Colonel Lindbergh was a guest of honor. The others present were:

Comdr. Richard E. Byrd, conqueror of the North Pole and leader of the flight of the "America" from New York; Clarence Chamberlin and Charles Levine, who crossed the Atlantic and continued on to Germany in the longest single

President Coolidge presenting Colonel Lindbergh with the Hubbard Medal.

flight ever made; Ruth Elder and Capt. George Haldeman; William S. Brock and Edward F. Schlee, whose around the world flight ended in Japan; Arthur C. Goebel, winner of the Dole flight to Hawaii, and Paul Schulter, second place winner in that contest; Lieutenants Hegenberger and Maitland, first to fly from San Francisco to Hawaii; Lieut. George Noville and Bernt Balchen, companions of Commander Byrd on both the North Pole and Atlantic flights; Emory Bronte, companion of Ernest L. Smith on the Hawaiian flight, and Lieut. W. C. Davis, who accompanied Colonel Goebel.

Ernest L. Smith, Bert Acosta and Martin Jensen were unable to arrive in Washington in time to attend the luncheon.

Before going to the White House many of the President's guests attended a "meteorological forum" at the Department of Commerce, in the office of William P. MacCracken, Assistant Secretary for Air, where there was an exchange of ideas between government weather experts and those who had hazardously followed their charts. The purpose of this gathering was to give a better idea of how future weather data might be prepared for tans-Atlantic flights.

Participating in the meeting were: Dr. James Y. Kimball of the United States Weather Bureau, New York City; Charles L. Mitchell and R. Hanson Weightman, forecasters of the United States Weather Bureau at Washington; Dr. C. G. Rossby, Chairman of the Committee on Aeronautical Meteorology of the Guggenheim Foundation for Promotion of Aeronautics, and the following members of that committee: Maj. William P. Blair, representing the army; W. R. Gregg, representing the United States Weather Bureau; Lieut. F. W. Reichelderfer, representing the Navy Department.

All the pilots present at the conference related their experiences with the weather on the flights and compared these with the forecasts. The weather bureau experts told of the difficulties in predicting weather conditions with inadequate reports from vessels and Europe.

C. G. Rossby, Chairman of the Daniel Guggenheim Committee on Aeronautical Meteorology, made public recommendations of the committee for an experimental weather reporting service between Chicago, Cleveland and New York. The report has been submitted to the Assistant Secretaries in charge of Aeronautics in the Commerce, War and Navy Departments, to the United States Weather Bureau and to Mr. Guggenheim.

It is proposed that each airport be surrounded by a dense local network of meteorological stations that will gather constant information on flying conditions.

Major de Bernardi Sets New World's High Speed Record

IT WAS recently reported by the Royal Italian Aero Club that on Nov. 5, 1927, Major de Bernardi, winner of the Schneider seaplane trophy last year, had again broken a speed record by attaining the world's highest speed for any type of plane. Over the three kilometer course at Lido, Venice, Italy, where the Schneider race was held this year, he made a speed of 298.7 m.p.h. breaking the record recently established by Lieutenant Webster of England. It was announced a short time before that Major de Bernardi had made an unofficial time of 302.5 m.p.h. and that the tests were repeated in order to establish an official record. Using a Macchi seaplane with a Fiat engine he flew over the course four times and with the wind he attained a speed of 315.5 m.p.h.

Lieut. Al Williams had his Kirkham racing plane with the 1200 hp. Packard engine in the air recently and as the plane now is with wheels replacing the pontoons it is rumored that he can beat the high speed record established by the Italians.

N.A.C.A. Technical Note No. 268

THE NATIONAL Advisory Committee for Aeronautics recently published Technical Note No. 268 entitled "Mass Distribution and Performance of Free Flight Models" by Max Scherberg and R. V. Rhode. The paper, as the title implies, deals with the mass distribution and performance of free flight models. An airplane model which is to be used in free flight tests must be balanced dynamically as well as statically, e.g., it must not only have a given weight with the proper distribution of load but also a given ellipsoid of inertia. Equations which relate the motions of an airplane and its model are given. Neglecting scale effect, these equations may be used to predict the performance of the airplane, under the action of gravity alone, from data obtained in making dropping tests of a correctly balanced model.

Side Slips

By ROBERT R OSBORN

E.G.P. sends in a clipping from a metropolitan paper, showing a picture of Lieut. "Al" Williams under the title "Five Miles a Second". He inquires if this might not be an exaggeration, as five miles a second is 18,000 m.p.h. We happened to be present when this particular speed test was made and it is our opinion that the reporter merely misplaced his decimal a couple of places. This particular reporter's college may have won a football game the day before, and having been celebrating more or less continuously since the news came in, a few miles per second one way or the other wouldn't bother him much. We have made inquiry about among those who know, and it seems that no airplane has attained this speed as yet, but the rumor is around that a chap is working on one that will.

* * *

A newspaper account of an accident to one of the German seaplanes attempting to take off from the Azores for a flight to the United States, reads as follows "A launch succeeded in getting the partly submerged plane in tow and reached shore, where it was found to be a total wreck. The pontoons were completely smashed and one wing was missing. The commander of the plane and his companions have not decided what their next step will be." We can readily understand their indecision regarding their next step, as the results of their first step make it very apparent that the ship wasn't designed for much wing walking.

Mr. G.A.P. has brought in an interesting souvenir of younger days,—a ticket of admission to one of the old Beachey-Oldfield exhibitions. The face of the ticket modestly states that the days events will be for the "Championship of the Universe. Beachey-Oldfield. Loop the Loop. Upside down. Flying and Racing." As there is no date on the ticket and no location mentioned, it seems that the championship of the universe was a rather fleeting title, and was likely to change hands whenever a group of a hundred or so spectators could be gathered together to witness another contest.

As one of the rules printed on the reverse of the ticket, we find "Spectators are warned to keep off the track, particularly in case of accident, so as to avoid a fatality by being injured."

* * *

This Week's Prize for Futility has been awarded unanimously to the sculptor who sculped the book-ends, which are being advertised now for ten dollars. On these book-ends Colonel Lindbergh is represented standing in front of his "Spirit of St. Louis". The unfortunate part is that the artist modeled in, quite prominently, the Curtiss Field "dolly" which is supporting the tail skid.

As we have had four thousand, three hundred and fifty-one people ask us why a wheel should not be used instead of a tail skid, and we dare say that everyone else associated with aviation has been asked the same question numberless times, these book-ends ought to turn out to be very popular. We'll bet, too, that there will be thousands of self-styled inventors who will be pointing out that their invention was used on the Ryan monoplane, and "if some of these big companies had only listened to me, look where they would have been now."

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The novel shape of Edo floats is correct on top as well as on bottom. The flat deck and the square stern will enable your passengers to get in conveniently without assistance. The shape of the bottom will allow you to get off with full load in any weather and from water either smooth or rough, either salt or fresh.

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AIRPORTS AND AIRWAYS

Los Angeles, Calif.

By Charles F. McReynolds

The first man ever to buy a round trip ticket for a transcontinental flight via an established air line, Will Rogers, cowboy humorist, movie star, author and politician, returned to Los Angeles after an absence of only three nights. He spent a night and part of a day in New York City. The fastest passenger train leaving Los Angeles at the same time Will Rogers left by plane would not have reached New York by some hundreds of miles at the time that the first round trip transcontinental air passenger had returned to his wife and family.

Will Rogers flew the Western Air Express route, from Los Angeles to Salt Lake, in a Douglas mail plane piloted by Jimmie James; from Salt Lake City to Chicago he was carried by Boeing Air Transport in the Boeing mail plane, and from Chicago to New York by N.A.T. The return flight was uneventful, although his plane had been forced down in a rain storm near New York on the eastward flight, and he made the last lap from Salt Lake City in near record breaking time with pilot Al De Garmo at the controls.

This trip marks the beginning of heavy transcontinental air traffic and the number of men who have booked similar flights in the past few days would seem to indicate that Los Angeles, with its large number of actors and moving picture representatives who must cross the country hurriedly, will generate a large percentage of such cross-country passenger carrying.

Raymond Hatton left for Chicago from Vail Field, two days after Will Rogers had started, bearing orange blossoms for the wedding of a friend. Wallace Beery, whose latest comedy has an aerial theme, has booked passage for Detroit, where he will confer with Jack Maddux, owner of Maddux Air Lines, which operate the Ford plane between Los Angeles and San Diego.

Dr. Frank W. Chandler, Los Angeles dentist, has arranged to fly to Detroit and back for a dental convention, in order to be away from his patients for as short a time as possible.

These few instances are certainly but an indication of the vast amount of such flying which may soon be expected to be in progress all over the country.

The municipal airport situation in Los Angeles has taken a most interesting turn. Twenty-two airport sites have been submitted and a resolution has been passed favoring at least two and perhaps three airports. The city planning commission has inspected all sites and narrowed them down to seven from which the final selection will be made. These seven sites are the Vail, Bandini, Hellman, Mines and Dominguez sites

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located to the east or south, and the Seanon and Van Nuys sites to the north-west in the San Fernando Valley. The council's finance committee is to report soon upon the practicability of an immediate purchase, as the sites under consideration run as high as three million dollars.

In the meantime the city of Long Beach, to the south, has completed plans for the enlarging of the Long Beach municipal airport to give a runway of over 5,000 ft., and to install all up-to-date equipment at the field.

In a speech before the Los Angeles Lions Club, Capt. C. H. Babb, Governor of the Southern California N.A.A. organization, told the guests that if an airport were not developed at once, Los Angeles would lose the 1928 air races.

Capt. Walter F. Parkin, Department of Commerce aeronautics inspector for Southern California, speaking at the same dinner, stated that in making his recent trip to Washington to report on local conditions he learned that twenty per cent. of all planes and one third of all licensed pilots of the United States are located in Southern California. Capt. Parkin announced that five additional inspectors will reach this district soon to aid him in his work. He also disclosed the fact that the Department of Commerce has supplied him with a Ryan Brougham plane for use in connection with his work in this district.

J. L. Mushett, Pacific Air Transport; R. C. Diggins, asst. traffic manager of Western Air Express; William Fox, Maddux Air Lines; and J. B. Alexander of the American Aircraft Corporation, Waco and Fairchild distributors, were among the prominent aeronautical guests.

The indispensability of the airplane to the modern business man, was the topic for a speech delivered by Theodore T. Hull, vice-president of the Pan-American Bank and president of the American Aircraft Corp., to the Downtown Business Men's Association at their annual banquet. Mr. Hull is a pilot and recently completed a round trip flight to New York, accompanied by Mrs. Hull.

Dr. Thomas C. Young, pioneer flying promoter of the southland, recently addressed the Retail Merchants Association on the subject of aviation, predicting wide spread use for all planes, from the flivver plane to the air liner, in the near future.

Harry H. Culver, president of the Los Angeles Realty Board, has left for an extended eastern tour by plane and predicts that the airplane will completely revolutionize the real estate business and the value of real estate by making out of the way spots accessible.

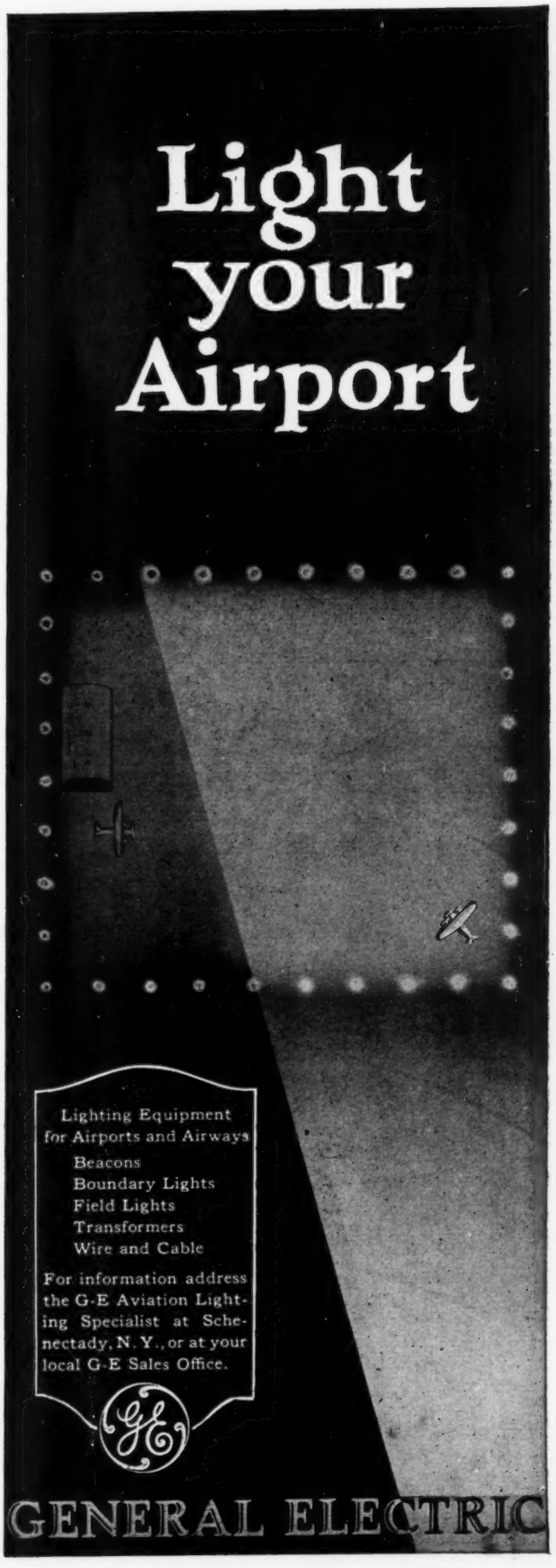
Alexander Hursh, local real estate dealer, has commenced operations with a six passenger Fokker cabin monoplane which makes weekly trips with prospective buyers to the location of Romola Acres, a great real estate development near Phoenix, Ariz. The trip is decidedly scenic, crossing the orange groves of Southern California, the Salton Sea, in the Imperial Valley; the date palms in the desert, and the mountains of Arizona.

To Regulate Stunting

A rather dramatic move to curb dangerous stunt exhibitions in Southern California has been made by Charles A. Warren, head of the Warren School of Aeronautics, Los Angeles.

One of Mr. Warren's pupils recently made an unauthorized parachute jump from a plane equipped with a balloon type 'chute and Mr. Warren accompanied by Capt. Walter Parkin, brought such testimony to the inquest that seems certain that all stunt flying in this vicinity will be strictly regulated by law in the future, thus giving legitimate flying activities a big boost.

The Warren School of Aeronautics has more than 180 students enrolled in ground and flying courses. The equip-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La.—Louisiana Airways, 1712 Pere Marquette Bldg., New Orleans
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Utah—Rocky Mountain Airways, Salt Lake City
Mississippi—Tri-States Airways, Bry Block, Memphis, Tenn.
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So. Carolina—Errett Williams, Spartanburg, S. C.
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ment is complete from woodworking to airplane and airport engineering and actual work in rebuilding old planes and constructing new types is constantly given.

The Ryan Mechanics Co., "Pop" Ayars, Lieutenant McNeeland, and Mr. Hunold, use Warren students considerably in the construction of their experimental plane.

The Warren School also provides a complete airport engineering service free for any Southern California city which cares to use it. The cities of Redlands, Colton and San Bernardino recently availed themselves of this opportunity and the Warren engineers made aerial photos and submitted plans and layouts for a tri-city airport.

The new parcel post rates are expected to greatly increase air mail traffic on the Pacific Air Transport lines according to President Verne Gorst. Pilot Richard Bowman, of that concern, recently made an unusual leap when he lost control of his plane in a storm at midnight while flying over mountains 7,000 ft. high. He made a parachute jump and landed safely on the very peak of a 6,000 ft. mountain, built a brush fire and walked out the next day. The plane crashed, did not burn, but so far is unlocated due to the rugged terrain.

Lieut. G. O. Noville, of Commander Byrd's polar party, recently in Los Angeles, made the statement that this city would be the likely point for the start of the South Polar expedition in 1928.

The Bach Aircraft Company has gone into production on their new air yacht and report the receipt of one order for ten planes already.

The State Corporation Commissioner has granted a permit to Maddux Air Lines, recently incorporated. The application states that the line between San Diego and Los Angeles, using the Ford tri-engined all metal monoplane has been operated at a profit for the past sixty days and the company intends to increase the equipment on this route and eventually establish a line between Los Angeles and Dallas, Tex.

Officers of the company are J. L. Maddux, president; Charles H. Lathrop and J. B. Lyman, vice-president; Benjamin Bledsoe, secretary; Perry Weidner, treasurer, and Harry H. Culver, C. C. Tanner and Milton Bacon, directors.

Jack Maddux has gone east to take delivery on the second tri-engined Ford plane and stated before leaving that he expected to have six planes in service within ninety days.

Emory Bronte, pilot of the first civilian plane to make the Hawaiian flight, is in the aviation supply business in Southern California, representing the Associated Oil Company among the flying concerns.

Southern California air travel has increased to such an extent that the Auto Club of Southern California has been deluged with requests for accurate maps of southern air routes. These maps have been prepared and are now being used with great satisfaction by a great many local pilots. H. C. Lippiatt, particularly, gives maps provided by the Auto Club of Southern California the credit for his winning of the Class "A", Pacific coast air derby.

San Diego, Cal.

By E. B. Hartley

Orders issued at Washington recently appear to indicate that the War Department has decided to restore Rockwell Field to its pre-war status as a great military aviation post. Sixty-two modern pursuit planes have been assigned to this field as the nucleus of the flying equipment for the 95th Pursuit Squadron, one of three units of the Seventh Pursuit group, which is to be permanently based at the local airport, effective June 1, 1928.

It was recently announced by Rear Admiral J. M. Reeves, fleet air force commander, that thirty new fighting planes, classified as F-2 B-1, all equipped with new type Pratt-Whitney aircooled engines, are to be delivered to the aircraft

squadrons here in January and February. The planes are being manufactured by the Boeing Airplane Company.

Peoria, Ill.

The flying field, at the Airport of Peoria, is a commercial field, leased by the Varney School of Flight, in cooperation with the Peoria Association of Commerce. It covers 81 acres and there are ten planes permanently on the field.

The Varney School of Flight will soon handle planes built by the Varney Aircraft Corporation in its new modernly equipped factory, which contains 13,000 ft. of floor space.

Night classes are being conducted this winter by the Varney School of Flight in the factory building at 1818 Main Street.

Philadelphia, Pa.

By Ray Krimm

Not to be outdone by her brother, Miss F. E. Maddock, of 31 Hermitage Avenue, Trenton, N. J., has joined him in entering the Pitcairn Flying School, Hallowell, Pa., near Philadelphia. Both are taking the ten-hour flying course and expect to become licensed private pilots.

The brother, A. C. Maddock, is running a friendly race with his sister to determine who can make the faster progress.

The Ludington Philadelphia Flying Service, Philadelphia Airport lessee, has been doing a brisk business in the sale of Waco Tens. During the last week in October, R. Sanford Saltus, Jr., vice-president, announced deliveries of new planes to J. Allison Buck, of Wilmington, Del., Walter Lifer, of Phillipsburg, N. J., and Aleck DaCosta, of Villa Nova, Pa.

Pilot W. J. Shaffer, of the Pitcairn organization, delivered a Pitcairn Fleetwing De Luxe, PA-4, a three-place plane equipped with an OX-5 engine, to Allen K. Owens, director of Whander Field, the new commercial airport of Reading, Pa., recently. Shaffer flew the plane from Pitcairn Field, Hallowell, Pa., to Whander Field, and carried a special consignment of express originating in the west.

A. M. Banks, another Pitcairn pilot, flew one of the Pitcairn Mailwings (PA-5), equipped with a Wright Whirlwind engine, to the Whander Field dedication and gave several exhibitions.

The Ludington and Pitcairn organizations have announced that the majority of their flying and other operations will be continued throughout the winter. Cold weather, apparently, is not to interfere with aviation development in the Philadelphia area, new flying clubs having been organized and interest in aeronautical activities increasing rather than waning.

For the purpose of stimulating interest in aviation among college students and the eventual establishment of a course in aeronautics at their university, forty students of the University of Pennsylvania have organized an Aviation Club and are making arrangements to purchase a monoplane.

The club also plans to employ a pilot to instruct them after they have taken a basic training course in aviation. A ground machine will be bought and placed on the campus so that students can accustom themselves to its operation.

The club has elected E. Edward Felker, of Beaver Springs, a senior in the Wharton School of Commerce and Finance, as president. Felker's ambition is to enter the Army Air Corps after graduation.

The Philadelphia Chamber of Commerce, particularly Hollinshead N. Taylor, chairman of its aviation committee, is supporting the new club, as is Dr. Josiah Penniman, provost of the University of Pennsylvania, and Dean Emory R. Johnson of the Wharton School. Dean Johnson is studying the possibility of establishing courses of instruction in commercial aviation in the Wharton School.

Explaining the club's aims, President Felker said:

"We are trying to interest the government sufficiently to

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have them establish a basic course in aviation in connection with the Reserve Officers Training Corps at the University. Members of this unit could attend the aviation camp at Langley Field, Va., each summer.

"We expect to buy a monoplane, probably one similar to Colonel Lindbergh's 'Spirit of St. Louis'. We also expect to hire a pilot and purchase a 'Ruggles Orientator', a ground machine used by the Army in training men to right themselves when thrown in any position. This machine will be placed in Weightman Hall, on the campus."

The club will establish a library of books and periodicals pertaining to aviation in the University Library.

R. Sanford Saltus, Jr., vice-president of the Ludington Philadelphia Flying Service, Philadelphia Airport lessee; W. Laurence LePage, assistant manager of Pitcairn Aviation, Inc., and Mr. Taylor addressed the first meeting of the club.

Springfield, Mass.

By Charles Hanson Gale

While the Dunn Field site for Springfield's municipal airport is being strenuously opposed by the residents of the town of Longmeadow in which it is located, and while it apparently continues as the site most favored by the airport committee of the city council, the residents of East Longmeadow are definitely out to boost the Drinkwater tract in this town of about 162 acres as the best site.

The Drinkwater tract is located east of the Dunn Field and about five miles from the river. The surrounding country is very level and about 110 acres are already cleared and could be easily annexed for expansion. The cutting of a few lots of trees would permit still further expansion in all directions. The tract would be admirably suited for all kinds of aeronautical activity, according to the residents.

The enthusiasm of the residents some time ago resulted in the organization of a committee to negotiate with the mayor of Springfield and the airport committee. The authorities made another visit to the field but the results of their survey have not been announced.

Dr. Harry F. Byrnes and Dr. H. C. Goodwin of this city have been appointed by the aeronautical bureau of the department of commerce as two members of the team of three to examine applicants for pilot licenses and the pilots in the Springfield air district. The appointments have gone into effect and examinations will start at once. A third member of the team is expected to be announced soon.

The Springfield air district extends east to West Warren, west to the New York state line, south to Windsor Locks, Conn., and north to Keene, N. H. The naming of this board is considered an important step in the development of Springfield's aeronautical equipment.

Winsor B. Day, president of the Flying Club of Springfield, spoke on aviation before the Realty Club recently. W. Kirk Kaynor, postmaster, also spoke on aviation and air transportation. Mr. Day is one of the most active local pilots and Mr. Kaynor is an enthusiastic booster for air mail.

H. H. Brooks, general sales manager of the Marmon Motor Car Company, arrived at Dunn Field recently on a business trip to this city. He used a Stinson-Detroiter cabin plane. Capt. J. Nelson Kelly was pilot and he was accompanied by Ray J. Barbin of the engineering department of the company.

The Flying Club of Springfield recently bought a parachute from Robert S. Fogg of Concord, N. H. The 'chute will be used by members of the club for emergency only and club rules insist that it be worn by members making solo or instruction flights at all times.

The club has continued flying since the crash of its Swallow through the courtesy of Harry Hermann.

Worcester, Mass.

By Henry T. Ford

The Worcester air pageant has aroused considerable interest in aviation in this section of the country. Marlboro, a city of 15,000, 14 mi. south of Worcester, and Sudbury, the Massachusetts home of Henry Ford, are casting about for locations for flying fields.

The Marlboro Enterprise is the sponsor for the field in that city and several conferences have already been held with Army officials and constructors of flying fields. Several sites have been discussed but the problem seems to be a sufficient number of acres which can be made a flying field at a small cost. The town is not particularly prosperous at the present time due to an industrial depression.

A recent decision of the owners of the flying field at Framingham to light the field at night is welcome news to pilots. A heavy fog recently prevented Eddie Stinson from sighting the field and forced him to land with four passengers in Sherborn, eight miles east of Framingham.

The Gardner Field is rapidly nearing completion but it is doubtful that landings will be allowed this year. Carl W. Kenniston, construction engineer of the Kenniston Co., Concord, N. H., is in charge. The runways have been cleared and two stonewalls removed. The official dedication will take place next spring.

Interest in flying in Worcester has increased since the pageant. All of the commercial planes did a good passenger-carrying business while they were at Whittall Field. The tri-engined Fokker of the Reynolds Airways, Inc., piloted by "Eddie" Conerton, remained at the field for a week and for one day reported gross receipts of over $800.

James P. Whittall has purchased a Driggs Dart II and is awaiting delivery. The plane was expected to be in Worcester for the pageant but developed engine trouble in Buffalo and it was necessary to return the plane to Lansing.

A new hangar will be erected at Whittall Field but some doubt exists as to whether it will be erected before the snow falls. There are three planes at the field at the present time and James P. Whittall's new plane is expected daily. John W. Lasell of Whitinsville, who was official starter of the air races at the pageant, has announced that he will purchase a plane during the winter for spring delivery.

Whittall Field is at present controlled by the Worcester Airport Inc. but it is expected that the field will be leased to an operating company in the near future. Several commercial companies including the New England Aircraft Corp., Hartford, Conn., and the Boston Airport, Inc., have held conferences with the Worcester corporation but no decision has been reached. A decision is expected before the first of the year.

The establishment of a school of flying instruction will be one of the terms of leasing the field, according to reliable information. Several applications for flying instruction were received following the pageant.

Kenniston Inc., Concord, N. H., will probably establish its central office in this city during the winter. Mr. Kenniston desires to be close to a flying field in the center of Massachusetts in order to make flights to all parts of New England where flying fields are being constructed by his company.

Westfield, Mass.

The Massachusetts Airways Corp., with headquarters at Springfield, has announced that it will also locate at the Barnes Airport, and within a few weeks will move to this point. The company will start an aviation school, with separate courses in flying, ground work and airplane mechanics

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and also shop detail. Passenger and freight service will also be carried on.

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Harold M. Parker, of Longmeadow, head of the Stutz automobile agency in Springfield, is president of the Massachusetts Airways Corp.; James A. Hearn, of Springfield, former war pilot, vice-president; Joseph E. Kerigan, Springfield attorney, treasurer, and William E. Buckler, mechanical engineer is also a member of the firm.

This company is the New England agent for the Alexander Eaglerock, and uses this plane in all its activities.

The Westfield and Holyoke Chambers of Commerce will build a hangar at the airport, which will be able to house a dozen planes and will also contain an office and a workshop. The field has been enlarged to four times its original size and clearing, ploughing, harrowing, seeding and rolling have been completed. The field is marked in the center by a large white circle and markers have been placed at the four corners. A wind cone indicator has been installed on a high pole and gasoline and oil tanks will be part of the equipment soon.

San Antonio, Tex.

By Frank Savage

H. P. Henning of this city has been awarded a contract for $1,400 worth of aerial survey work on the state highway between Austin and San Antonio.

The aerial survey is preliminary to an expenditure of approximately $2,000,000, which will be made by the State Highway Department in straightening out kinks and curves and eliminating railroad grade crossings on this main artery between the largest city in the state and the state capital.

An indication of the number of firms engaged in this work in Texas is found in the fact that bids were entered by Fairchild Aero Survey Inc., of Dallas, William F. Long of San Antonio, H. P. Henning of San Antonio and John D. Miller of Austin.

Immediate steps will be taken to make Winburn Field, formerly Stinson Field, a first class airport, Porter A. Whaley, manager of the chamber of commerce has announced. Recommendations for construction of hangars and installation of other necessary equipment will be made as soon as plans can be developed by the commercial aviation committee of the chamber of commerce, following recent inspection of the field by the committee, which includes Acting Mayor Phil Wright and the commanders of the various flying fields surrounding San Antonio. The committee which inspected the field was headed by B. R. Webb. Brig. Gen. Frank P. Lahm, commanding general of the Air Corps training center and Lieut. Col. James A. Mars, commanding officer of Duncan Field, also were in the party.

Myrtle Beach, S. C.

By H. T. Willcox

An airport to be one of the best in the country and large enough to accommodate the largest airplanes made, will be constructed at an early date at Myrtle Beach, according to official announcement of the Woodside Brothers of Greenville, S. C., and New York, owners of a vast area of 66,505 acres.

Des Moines, Iowa

By Merrell E. Boyce

The Des Moines Flying Club, recently organized, now boasts of nearly 100 associate members and over ten active student members. Miss La Vone Brown is the only one of

her sex to take up an active student membership as yet. However the roll call of students now numbers about twelve and they are joining fast. Instructions are given in one-half hour periods. Burd White is founder of the club and Chet Sutherland is the instructor.

Jack Walton, local flier and business man, attended the 1927 Schneider Cup Race in Venice, Italy. While attending the Legion Convention in Paris, Jack was accorded the privilege of flying a French Government plane.

Dr. T. C. Denny, local insurance man, boarded the Boeing Air Mail plane at the municipal airport here one night and stepped off in San Francisco some few hours later. A specially called conference on the west coast was Dr. Denny's perfectly legitimate excuse for this long joy ride.

Lest you forget—Leslie "Dick" Miller, who copped a few thousand dollars of the Spokane prize money, hails from Des Moines.

Milwaukee, Wis.

By H. C. Brunner

Nine prominent Milwaukeeans recently flew from this city to Minneapolis to attend the Wisconsin-Minnesota football game. Those who made the trip included Stuart Auer, who piloted his own Travel Air and carried John M. H. Nichols as passenger; Robert Gast of the Department of Commerce, aeronautics branch, who had Mrs. Auer and Miss Maida Marshall as passengers in his Wright engined Laird; Ben Eilson, also of the Commerce Department, who carried Eric Passmore in his De Havilland plane, and John Perry Wood, Wausau, who carried Ben Alexander, Wausau, in his Wright engined Waco-10.

Of those who made the tour, Mr. Auer, Mr. Nichols, Mr. Gast, Mr. Passmore and Mr. Wood were on the recent first Wisconsin commercial air tour which was sponsored by Alonzo Cudworth post of the American Legion.

W. A. Brooke and G. G. Budwig, who were sent from Washington by the aeronautics branch of the Department of Commerce, conducted examinations for government licenses recently at the Milwaukee County Airport. Eight men took the examinations for mechanics licenses and about an equal number for pilot's licenses. About fourteen planes at the airport were also inspected for government licenses.

Elling Weeks, president of the Weeks Aircraft Corporation, made his first solo flight in 13 years here recently. Mr. Weeks was a pilot when aviation was in its infancy.

Persons studying aviation in the aviation department of the Federal Railway Institute are organizing a Wisconsin chapter of the American Society for the Promotion of Aviation.

The Northwest Airways, flying the mail between Minneapolis, St. Paul, Milwaukee and Chicago, carried 25,000 lb. of mail in its first year recently ended without the loss of a single letter. The company's planes covered a total distance of 200,300 miles.

E. T. Jones, chief engineer of the Wright Aeronautical Corporation, addressed the Society of Automotive Engineers at the Athletic Club recently. He had with him one of the Wright Whirlwind engines of the type that carried Colonel Lindbergh across the Atlantic, besides having sectional parts of the engine. Mr. Jones illustrated his talk with photographic views and stereopticon slides.

Madison, Wis.

A reserve mail plane was stationed in Madison by Northwest Airways, Inc., when the city's air mail service was inaugurated recently.

Adj. Gen. Ralph M. Immell who returned recently after several weeks in Washington where he attended the Army war college said that there was little possibility of the Wisconsin

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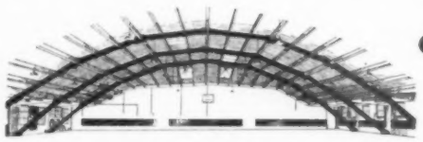

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National Guard having a flying unit. Corps air squadrons are on the government priority list for planes, he found. He also stated that the cost of establishing an air squadron estimated at $50,000, with $5,000 annually for maintenance, would be prohibitive for the National Guard.

Cincinnati, Ohio

On a particularly clear day recently, John Paul Riddle, general manager of the Embry-Riddle Company, commercial operators at Lunken Airport, saw towns at a distance of 50 and 60 miles from Cincinnati from a height of 12,000 ft. Over Cincinnati at that height, he saw Middletown and Hamilton, Ohio, Cynthiana, Ky., the Ohio River near Maysville, the river opposite La Grange and a hundred smaller towns dotting the enormous saucer below him. Mr. Riddle was making aerial photographs at the time, and declared he had never before seen a clearer day.

Surprise by airplane was the method adopted by the Corcoran family of Cincinnati on a recent trip to Hot Springs, Ark. Mrs. J. L. Corcoran had been at Hot Springs for two weeks taking the baths. Her husband and daughter Marie, decided to charter a Travel Air Hisso plane and then took off from Cincinnati at 8:30 from Blue Ash Airport. Her

From left to right: John P. Riddle, general manager Embry-Riddle Co., Lunken Airport, Cincinnati, Ohio; Mrs. Mary Bradstreet, and Miss Anne Cutler, of the "Enquirer"; Mrs. Ruth Neely France, of the "Post", and Miss George Elliston, of the "Times Star".

son, Nelson T. Corcoran and his wife, on their way back to the city from seeing their father and sister off on the trip, thought it would be fun to surprise not only the mother but the father and sister as well. They chartered the Embry-Riddle Company's Ryan Brougham, and piloted by Paul Riddle, started at 11:45 for Hot Springs. The Travel Air, after landing twice for gasoline was overtaken at dark at Little Rock, and Corcoran and his daughter finished the trip in an automobile.

They were surprised to find the son and daughter-in-law visiting with the mother who in turn was surprised by the visits of all four.

The younger Corcorans returned the next day in six hours, and father and daughter returned two days later.

Society is getting into airplanes in Cincinnati. Mr. and Mrs. John L. Shuff of Ft. Thomas, Ky., just across the river from Cincinnati, are planning a matinee flight instead of a bridge party or a tea for an afternoon soon. They will use the Ryan Brougham of the Embry-Riddle Co., and as many Waco planes of the same company as will be necessary to

handle their guests. The flight will consist of a trip over the beautiful country home of the Shuffs, a tour of Cincinnati and formation flying in the air, so that every guest will be able to see his fellow fliers en route.

Later, special trips from Cincinnati to Shakertown Inn, 100 miles over the Bluegrass section of Kentucky, will be flown by the Embry-Riddle Company for several of their clients. Afternoon tea will be served at the inn which is regarded as one of the most perfectly preserved Shaker houses in the country. It is one of several houses remaining of a Shaker settlement, the last inhabitant of which died a year or more ago. Kentucky's famous hospitality, supplemented by Kentucky's famous cooks are expected to make this one of the most popular trips for "elite" fliers, eager to be doing interesting and progressive things.

Location of a new airplane factory on Lunken Airport at Cincinnati will be accomplished when a committee of the East End of the city finds a building suitable for the operations of the International Aircraft Company which will move from Long Beach, Calif., to the Queen City.

Negotiations between C. E. Ogden, president of the Kodel Radio Corporation of Cincinnati and his brother Perry Ogden, of the International Company in California, resulted in the decision to move the company here and manufacture the three-place OX5 plane which has become popular in the West. This will be the first plane to be manufactured in Cincinnati if the negotiations for buildings are completed soon. According to members of the committee, the company wants to begin work within 30 days.

Lieut. Stanley C. Huffman, operations officer for the Embry-Riddle Company at Lunken Airport, will be instructor in the Embry-Riddle flying school for the new course of parachute packing and jumping, after his return from active duty at Wright Field, in Dayton. Under F. G. Manson, civilian parachute expert attached to Wright Field, Mr. Huffman is studying parachute design, structure and maintenance. The course at the school will be given at a slightly extra charge, and all students desiring to jump will be given permission when instructors regard their air experience as sufficient.

Rochester, N. Y.

By Joseph F. Farren

Once again Rochester faces the possibility of losing a golden opportunity. Five months ago, the city definitely announced that the field would be equipped. Commissioner of Public Works Harold W. Baker, who has charge of the field, spent several weeks touring the country inspecting the various airports and their equipment. Upon his return he said that the city would erect a $23,000 hangar by Oct. 1.

Although Oct. 1 has come and gone, the field is still without adequate equipment. According to Baker, the city cannot possibly spend a cent before April 1.

Although this condition exists on the field, Rochester fliers are continuing their activities. Bill Dunlop has been making a number of trips to Troy, Ohio, the home of the Waco's, which plane he handles in this part of the state.

Paul Herman and Charles La Bar, of Brizee Aviation Field, returned recently from a months barnstorming tour in the northwestern part of Pennsylvania. The boys used a Pitcairn Orowing on their trip.

Capt. Merrill K. Riddick, president of New York and Western Airways, Inc., has returned from New York City, where he planned to join the Marsh South American Exploration Expedition. Riddick announced that his company will soon make plans for the opening of its first air line, Rochester to Montreal, early in the spring.

The Rochester Flying Club, which is creating considerable interest in aviation through talks and showing of airplane motion pictures, held its second dance of the year recently.

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The dance was given to raise a small fund for aeronautical books for its library. Besides having a good time, the organization raised quite a sum.

At its last meeting the safety characteristics of an airplane were discussed by Gordon Taylor, first vice-president. Mr. Taylor also explained the construction of the airplane. He is engaged in manufacturing airplanes. The annual election of officers of the Flying Club will take place at the next meeting.

Schenectady, N. Y.

By Milton Turk

Schenectady has been assured air mail, passenger, and express service by April 1. James A. Walsh, director of the airport, made this promise after a recent inspection. Mr. Walsh journeyed from New York City, where he is connected with Colonial Western Airways as assistant secretary and treasurer. Mr. Walsh announced, in addition, that Schenectady would be made the headquarters for operations on the proposed Albany-Schenectady-Cleveland air mail route. Preliminary preparations have been discussed with Postmaster Conde.

At the present time, the runways and the first hangar are nearing completion. The William E. Arthur Company, who has charge of the engineering end of the construction, is pushing the work rapidly.

The port is owned by Schenectady Airport, Inc., who purchased 195 acres for the development of an airport that will compare favorably with the finest any city can produce.

The field is conveniently located, as it is only three miles from the center of the city, on the Schenectady-Saratoga road.

Plans call for two runways, one running north and south, and one east and west. Both will be 150 ft. wide, with the N/S runway 1500 ft. long and the other 2000 ft. long. Natural drainage and a sandy clay surface facilitate engineering work.

The Adirondack Power and Light Company has had a 125 ft. arrow painted on the roof of one of the company's buildings. This arrow is 125 ft. long and is pointing towards the airport. It is accompanied by the words "Schenectady Airport—3 miles". It can be read clearly at 3000 ft.

The General Electric Company, besides having a sign similar to the one just described, is experimenting with an illuminated arrow, to facilitate night flying. These experiments include the use of Neon lights as well as the standard type of illumination. The company has given the airport directors a great deal of cooperation through the advice of the experts of their airport division. The latest developments in airport lighting will be used on the field.

At the present time the field is being used by the Inter-Cities Airways Company, headed by A. Rickard. The equipment consists of a Waco and a Standard. Mr. Rickard intends to enlarge his fleet soon by the addition of another Waco and a Stinson 5-place cabin job.

Besides conducting a passenger carrying service, doing oblique photography work, and such advertising as the distribution of handbills, the Inter-Cities Airways conducts a flying school, with Mr. Rickard as chief instructor. So far this year 15 students have completed the full course, and three more are on the road to graduation in the near future. The passenger carrying business of the company increased tremendously during the course of the summer, and Mr. Rickard announces an excellent year. Moreover, all flights were conducted without a mishap of any kind.

At the present time Inter-Cities Airways has the subagency for Waco, and negotiations are being completed for the full agency.

The temporary runway is in good shape, and Mr. Rick-

ard extends an invitation to pilots to visit the field. The field is easily discernible from the air. There is a bus line to the city, and the airport has telephone and telegraph connections.

The Old Gold plane on its tour of this section was a guest of the airport as was Eddie Stinson, who stopped here on his 20,000 mile Pathfinding Tour.

There is quite a bit of talk around town concerning the formation of an aero club for the purpose of purchasing a plane and operating it for the instruction of club members. It is highly probable that such a club will soon make its appearance.

Norman, Okla.

By Ernest W. Fair

Jimmy Hazlip, student in the University of Oklahoma, and member of the Oklahoma Air Transport Co. here, has been raking in the dollars from student flying work nights, Saturdays and Sundays. He has just left for Ohio to get a new Waco which the company has bought, and which he is to fly back. The company bought two Wacos last year, only one of which they now have, the other having been wrecked in a storm near Shawnee.

B. S. "Cheebie" Graham is back on the job with the Oklahoma Air Transport Co. of which he is head. He has been ill for several days and only recovered from an operation recently. Graham devotes a good deal of his time to his business and some also to the Oklahoma Stadium Union of the University of Oklahoma of which he is head. He is very popular on the Oklahoma University campus.

An aviation club was in formation at the university but was abandoned after it was found that better work could be done by affiliating the students with the Oklahoma City Aero Club where they will obtain not only ground school instruction but also instruction in actual flying. Many students from the university are members of the above club and attend the weekly meetings, according to George Severin, organizer and president.

Flying conditions have been exceptionally good here with very few hard winds and hardly any rains within the last month. Winds have as a rule, been southerly with a few very mild northers.

The local hangar has been remodeled throughout the interior very effectively.

Graham and Hazlip have several white stakes about the landing field that are used as markers. These are at the edges of the field or directly over holes. However there are no holes on the field.

Frank Dennis, editor of the student daily newspaper, the Oklahoma Daily, is one of the flying cadets at Grahams school.

Atlanta, Ga.

By L. T. Jones

With the arrival of new planes at Candler Field and the aviation show in the City auditorium, Atlanta is rapidly increasing in importance as an airport.

Another aeronautical honor has come to the city in the election of Henderson Hallman as governor for Georgia of the National Aeronautical Association. Mr. Hallman has been the leading advocate of aeronautics in Atlanta and has served some time as president of the Atlanta Chapter of the N.A.A. He has resigned his position to accept the governorship for Georgia of the association. Hallman was chairman of the big civic committee that recently gave such a rousing reception to Colonel Lindbergh. Mr. Hallman succeeds R. E. Cone, also of Atlanta, in the governorship. The Atlanta chapter will soon hold a meeting to elect a successor to Mr. Hallman and to elect other officers. He has

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announced that the organization throughout the state of other chapters of the N.A.A. will be his first concern as governor. As he is a hustler, it probably will not be long before there are chapters of the N.A.A. in many Georgia cities.

Candler Field has been the scene recently of marked activities. Beeler Blevins, who is now professor of aeronautics in the Georgia Military Academy here, flew a Ryan monoplane from San Diego to Atlanta. It is similar to the Lindbergh plane, has certain improvements, and carries four passengers and a pilot. It will be used for passenger sightseeing flights at Candler Field.

Douglas Davis flew a new Waco-10 from the Waco factory at Troy, Ohio. It will be used for commercial flights, at Candler Field.

Mr. Blevins flew from San Diego to Atlanta, 2100 mi., in 19 hr., 40 min., making four stops. Davis made the 550 mi. from Troy in a non-stop flight of 4 hr., 5 min.

Both planes are the first to be stationed at Candler Field equipped with Wright Whirlwind engines.

Atlanta's first aviation show included an excellent line of exhibits. It was held in connection with the third annual radio electrical exposition. Three planes were on view. They were an American Eagle, an Alexander Eaglerock, and a Waco-10. All were equipped with Curtiss OX-5 engines. Taft Hall, where the exhibit was housed in the City auditorium, had doors so small that the planes had to be knocked down and rebuilt for the exhibit.

Commercial aviation is developing rapidly in Atlanta. A new corporation has been organized by Douglas Davis, as president which will conduct a flying school at Candler Field, build planes, bid for mail routes, and gradually inaugurate a passenger service in Georgia and perhaps other southern cities.

The Atlanta Aero Service has been started by Dan Mills, with a flying school at Tuggle Field, Decatur, a suburb of Atlanta. A considerable number of students are attending ground courses and studying engine building, and flying.

UNITED STATES AIR FORCES

Army Compiles Aviation Texts

Having blazed trails in many activities other than military, the Army has found another pioneering field in the compilation of texts on aeronautics. The progress of aviation development has been so rapid that the writing of authentic and authoritative texts has not been able to keep pace. Sources for such texts are few, as a consequence of which their compilation must of necessity be original work, which makes the process slow and difficult. In addition, new developments come so rapidly that texts become obsolete before they can be re-written. Faced with the necessity of providing a means whereby instruction in aeronautics could be placed in book form, the Army took up the task of compiling texts on all branches of the subject.

That the results of this work are in demand is indicated by requests to the Secretary of War by aviation schools for permission to use certain War Department aeronautical instruction documents as texts in the course of their school instruction. In reply, the secretary has stated that the War Department has no objection to the use of the documents provided due acknowledgment be given the War Department in case any of the documents or parts thereof are reprinted into school or other texts not Federal Government publications, and that such acknowledgment be incorporated in the reprint, and provided that the school comply with the Federal statute, which prohibits the re-sale of any United States Government document at a profit.

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PUBLISHER'S NEWS LETTER

A visit to Friedrichshafen is always a pilgrimage that brings aeronautical visitors to a shrine of aerial beginnings. Here is the place where Count Zeppelin had his early vision of lighter-than-air rigid development. Here, too, were made the early experiments in the use of light metals and the all-metal airplane forecasted. Here were constructed the first airship hangars and the first flights attempted. The Bodensee flew from here to Berlin on the first regular commercial airship route in the world. The important Dornier metal development started under the inspiration of Count Zeppelin has always radiated progressive ideas from this beautiful town on the shores of Lake Constance, or as it is termed in German, the Bodensee. During the war it was one of the important centers of airplane, airship and engine development. Since the armistice it has been but a shadow of its previous aeronautical glory. At Friedrichshafen the Los Angeles was built and the Dornier flying boat developed, but owing to limitations of the Versailles Treaty progress has been very much hampered. In 1926, the opportunity for construction of aircraft was greatly increased by a broadening of the restrictions by the Allied Commission. It was, therefore, interesting to observe this year the change that had come over the city during the last twelve months.

* * *

Of course, Dr. Hugo Eckner, head of the Zeppelin Company and the successor to Count Zeppelin is the towering genius of the airship world and it was an exceptional courtesy to find him waiting at the dock for the arrival of his American visitors from Switzerland. Quite apart from the aeronautical interest that every visitor naturally feels in seeing the aircraft works at Friedrichshafen, the provisions for the comfort and entertainment of those who come to the city are exceptional. The Kurgarten, a most carefully designed hotel, was located on the picturesque lake with an extensive view of the Alps. Here, guests are made to feel that they are more than passing visitors—they are shown courtesies that make them wish to prolong their stay and return whenever possible. Dr. Eckner and Captain Ernest A. Lehmann, whose experiences during the war with Zeppelins are well known throughout the aeronautical world reflected the enthusiasm that is felt by the German people over the construction of the new type of Zeppelin now nearing completion. The life of this small place is dependent largely on the aeronautical work that is being done there. During the period when the vast hangars and shops of the Zeppelin works were empty, the depression was not only financial but mental. Dr. Eckner, through public subscription, has gathered together funds to commence construction work again and everyone from the executives to the humblest residents are looking forward to the time when airships will fly from their birthplace to all parts of the world to establish a network of lighter-than-air international commercial air routes.

* * *

The new Zeppelin that is under construction, as is generally known, has an innovation that may change the whole trend of airship design. The fuel used will be a gas which is not greatly different from ordinary illuminating gas. It will be carried in gas cells which are placed below the ordinary hydrogen cells. It has been found that little change has to be made in the engines to use this gas instead of liquid gasoline. The fuel gas has about the same specific gravity as air. This permits long trips being made with little change in the weight of the fuel, whereas, in the gasoline burning airships the load is very heavy at the start and decreases gradually during the voyage. Such a gain has been made that Dr. Eckner now plans to encircle the globe on a non-stop flight. The first long flight next year will be to the United States probably through without stopping to San Diego. Later it is hoped to put this ship into service between Europe and South America. As the plans provide for the completion of the new airship by spring it is not improbable that next year when the trans-Atlantic airplane crossings are at their height that a new Leviathan of the skies will pass over the United States and demonstrate again the possibilities of this type of aircraft.

* * *

The design of this gas powered airship has many refinements and several notable changes. The type of girder that has hitherto been standard in Zeppelin construction has been improved and simplified and while it was perfected too late to have all the ship of this construction, it is being used very generally. It is not only stronger but very much cheaper to produce. The division of the interior of the ship into upper and lower sections to accommodate the hydrogen and fuel gas cells introduces a new longitudinal girder which it is believed will add to the strength of the airship. The power will be greatly increased by the use of new types of engines which are now permitted to be built in Germany. With this German Zeppelin and the possibility of at least one of the English airships being completed in 1920, this branch of aeronautics will, it is believed in Europe, receive a great stimulus next year. At another time the work of Dr. Dornier will be described.

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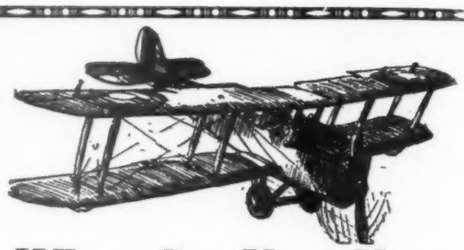

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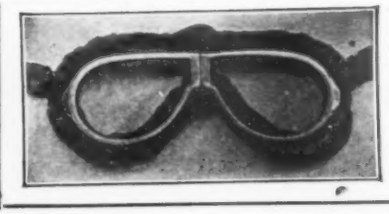

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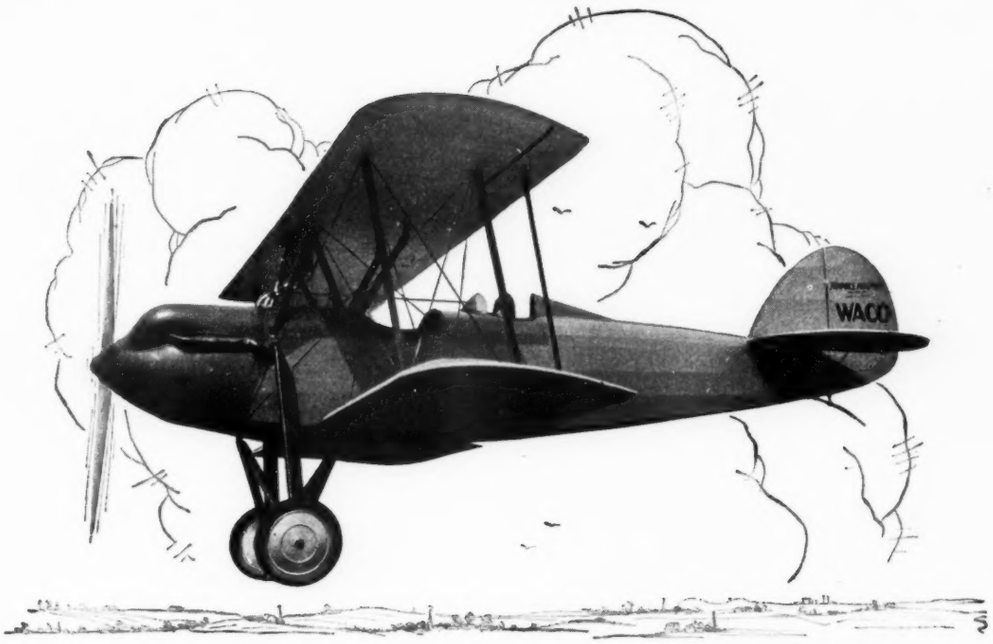

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